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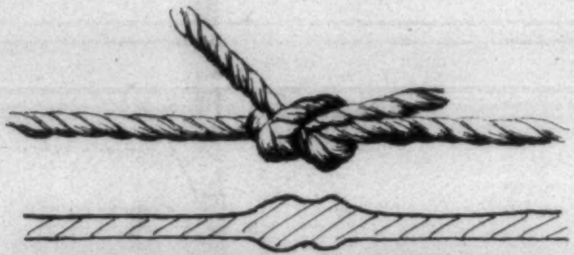
SOUTHERN
TEXTILE BULLETIN

VOL. 29 CHARLOTTE, N. C., THURSDAY, DECEMBER 24, 1925 NUMBER 17

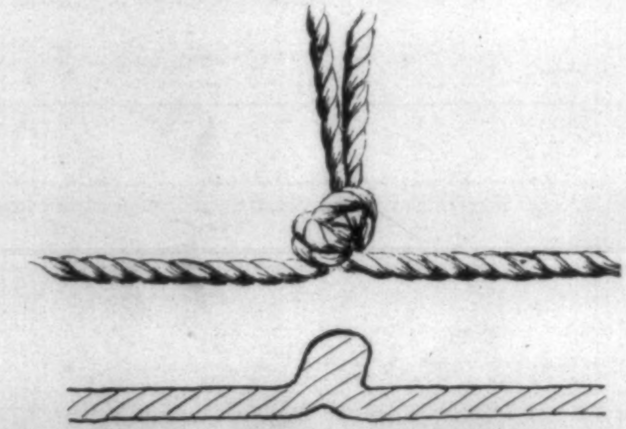
BOYCE WEAVERS' KNOTTER

We call your attention to the two types of knots shown below—at the left, the Improved Boyce Knot, as produced by the Boyce Weavers' Knotter. The cut at the right shows the old-fashioned spooler knot. The use of this old-fashioned spooler knot has cost the cotton mills of the United States enough money in the way of lack of production, and seconds, to put a considerable stretch of cement paving in every one of the 3,014 Counties of the United States.

By adopting the BOYCE WEAVERS' KNOTTER, the mills can save this profit for themselves.



BOYCE KNOT



SPOOLERS KNOT.

Note from the illustration of the Boyce Knotter that the knots will weave right into the cloth and bury themselves, thereby being invisible. It is absolutely impossible to imbed the spoolers knot into the cloth, to say nothing of loss of production caused by spooler knots on looms and resultant inferior grade of cloth, or seconds, which show small holes in the cloth when knots are pulled out by the cloth inspector.

The illustrations above do not exaggerate the proportionate scale of difference between the Boyce Weavers Knot and the Old-Fashioned Spoolers Knot.

WITHIN THE PAST WEEK WE HAVE SHIPPED 65 BOYCE WEAVERS' KNOTTERS TO ENGLAND, 172 TO CANADA, AS WELL AS FILLING ORDERS FROM 46 SOUTHERN MILLS AND 22 NEW ENGLAND MILLS. OUR SHOP IS RUNNING DAY AND NIGHT.

INCREASE YOUR WEAVE ROOM PRODUCTION, DECREASE YOUR SECONDS, IMPROVE THE CHARACTER AND QUALITY OF YOUR CLOTH BY ADOPTING THE BOYCE WEAVERS' KNOTTER.

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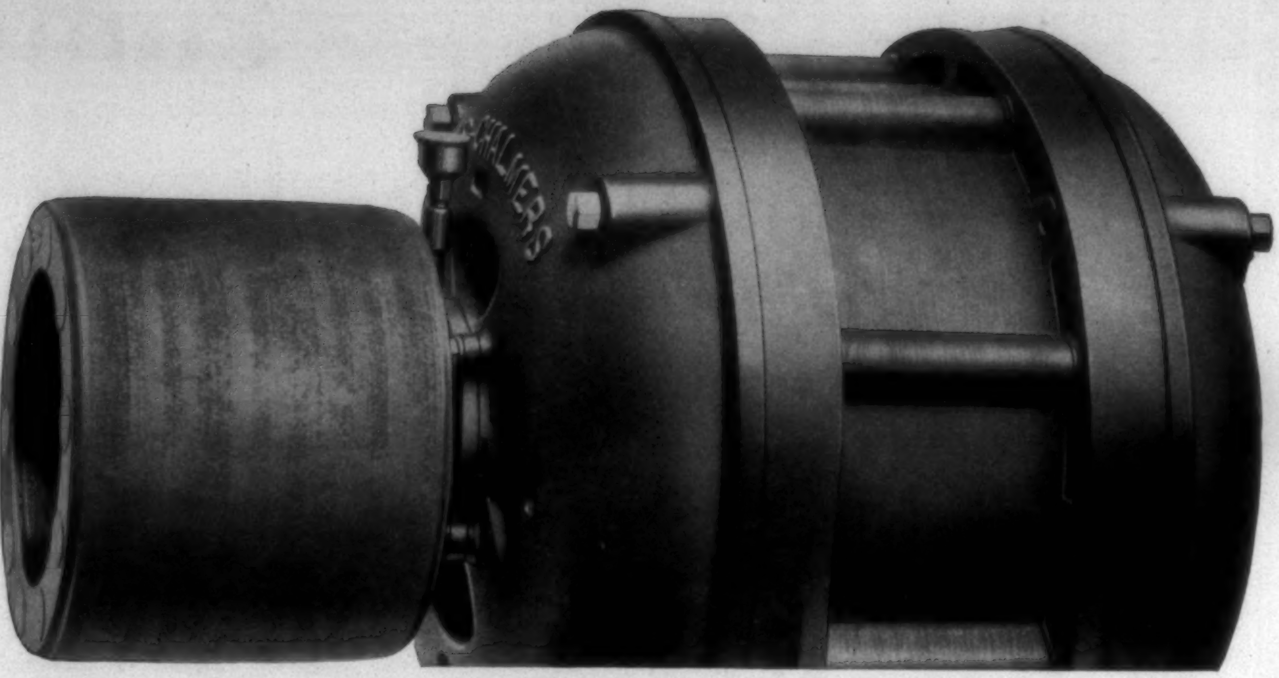

SAVING

Many of the greatest electrical projects in the world are Allis-Chalmers accomplishments. Credited to Allis-Chalmers too, is much of the most vital progress in standard electric motors. And now comes a highly-developed new series of induction motors augmenting the established Allis-Chalmers line.

New economies of motor operation are achieved by taking all motion on Timken tapered roller bearings. So compactly are loads carried—whether radial, thrust, or shock—that shorter, more rigid shafts, with less overhang, are used. All but a very minor portion of routine lubrication and inspection costs are eliminated. Permanently correct clearance is assured.

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Traditional Allis-Chalmers economy is reinforced in Allis-Chalmers roller bearing induction motors, a notable addition to the Allis-Chalmers line. An Allis-Chalmers representative or a request for data will bring full information.

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The Universal Winding Company, Boston, announces the opening of an office at 1326 Candler Building, Atlanta, Ga.

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Our Atlanta Office is opened for the express purpose of taking care of the requirements of our good customers in the States of Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas.

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UNIVERSAL WINDING COMPANY

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HOUGHTON

Metal Tipped

A Shoe-String Story

by Chas. E. Carpenter

Not Tipped

MOST millionaires started with a shoe string.

I started with a shoe string, but was not quite so fortunate.

It was this way:

Some quarter of a century back, when I first became personally active in the leather belting business, I noticed some mechanics lacing a belt with rawhide lace. I thought it a slow, clumsy and antiquated process. My attention was particularly attracted by the largeness of the lace hole, made necessary by the difficulty of pushing the lace end through, and the great amount of time lost in getting the lace end through the lace hole.

So, ignorant like, I asked why they did not tip belt lace, the same as they tip shoe lace and no one could tell me. Then I, still ignorant like, went and did it. The old-time belting men laughed at me, because I was a novice, and of course no novice in any line receives credit for knowing anything . However, I kept right on putting tips on lace leather, until today the largest seller in lace leather is HOUGHTON'S METAL TIPPED VIM LACE LEATHER.

VIM Lace possesses many other advantages besides being metal tipped, inasmuch as it possesses greater tensile strength although of only three-fourths the bulk; is soft and pliable and therefore cannot become hard and brittle; it is elastic and therefore does not tear out the lace holes; and is guaranteed to last twice as long as rawhide lace.

VIM LACE LEATHER is also sold in sides, if you prefer to cut your own lace.

But again I must make a confession. Inasmuch as Ben Nit's creed teaches that everything containing water is fraudulent and adulterated, I think it only fair to announce that VIM Lace Leather will average about 2½% water, and that I know of no way we can ship the dry lace leather and permit the mills to follow Ben Nit's advice and add their own water.

Trial lots of VIM Lace Leather will be sent on approval.

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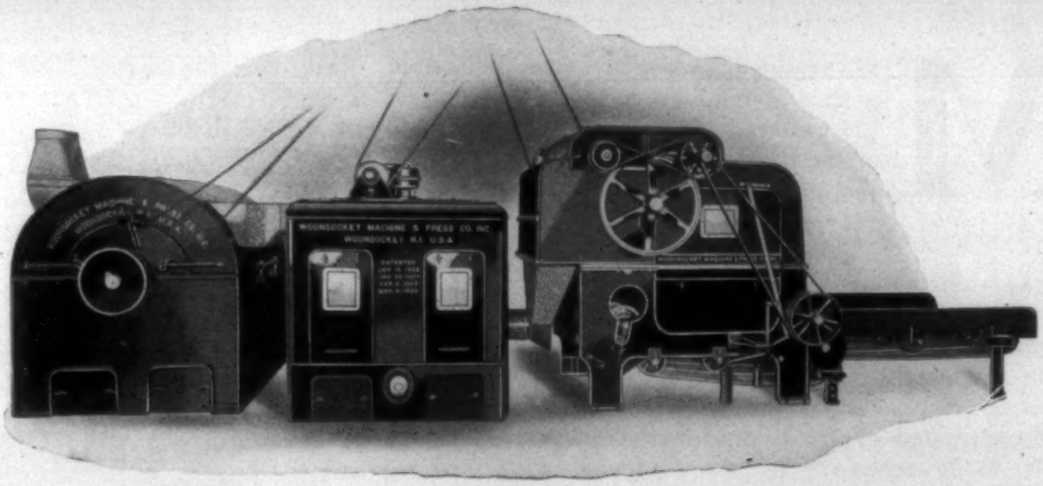

Horizontal Cleaner, Vertical Opener and Bale Breaker

MR. MILL MAN:

Cotton crop reports indicate a large percentage of **Strict Low Middling**, especially the late picked cotton.

This news is of little concern to the mills equipped with Woonsocket Opening and Cleaning Machinery.

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TEXTILE BULLETIN

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VOL. 29 CHARLOTTE, N. C., THURSDAY, DECEMBER 24, 1925 NUMBER 17

Power Plants for Textile Mills

Address by Charles T. Main, Engineer, Boston, Mass., before Textile Division of the American Society of Mechanical Engineers.

MOST of the earlier textile mills were located upon a river, in order to take advantage of water power. Many of the manufacturing centers were started in this way, and the sites of many of the isolated mills were chosen for this reason. Many of the water powers which have been so used have been outgrown, and in some of these places there is a preponderance of steam power over water power. New centers of manufacturing have grown up, where cheap fuel and low transportation can be obtained, and many mills are driven by steam power.

More recently the transmission of electrical current and the use of electrical power in the mills has caused water powers which were remote and of no value to become useful and valuable, and has enabled the construction of central power stations near the mines or on tide water, where cheaper fuel can be obtained. These recent developments have made is possible to locate the mills more advantageously with reference to labor centers, and with reference to the physical structures, light, and railroad facilities.

Power Rarely 5% of Total Cost of Product of the Mill.

The chief items of the cost of textile manufacturing are materials and labor. The cost of power is rarely over five per cent of the total cost of the product of the mill, and while the cost of power is an item which should receive careful consideration, it is of more importance to locate in some place where a sufficient number of operatives can be procured, and where reasonable freight rates can be made, than to locate where power is cheap and the other items lacking. The relative importance of locating where power is cheap in-increases as the ratio of the cost of power to the value or cost of the product increases.

Some of the earlier mills located on a variable stream, primarily for the sake of using water power, which power, to a large extent, requires supplementary steam power, are probably handicapped on account of their location, the restricted methods of construction and by the necessity of maintaining the running a double power plant.

At the present time, many of these restrictions have been removed on account of the possible use of electric power produced by the company itself, or which can be purchased from some power company producing by water or steam, a combination of both.

In many instances, the promoter of a new enterprise can have his choice of producing his own power, or of purchasing electric current from a public service corporation. The latter course is now largely followed by mills of moderate size, which have not a considerable use of steam or warm water in the manufacturing processes. The problem of the type of plant to be used has largely disappeared.

With the exception of some plants of small size, nearly all the power installations being made in textile mills now use electric transmission. In this paper it is, therefore, assumed that the power will be transmitted electrically.

In the earlier electrical installations it was common practice to use large motors, 100 h. p. or more in size, to drive large groups of textile machines. There has been a continuous tendency to decrease the size of the group of machines driven by one motor, and to use the individual motor for each machine. It is common practice now to limit the size of motors for group drives to about 40 or 50 h. p., and to use individual motors ranging in size from 1-2 h. p. to about 10 h. p. on many of the textile machines.

Conditions Affecting Power Problem

As regards the conditions which affect the power problem, textile mills may be divided intc two general groups:

(a) Plain goods cotton mills, which require little or no steam or warm water in their manufacturing processes, an other similar mills.

(b) Woolen and worsted mills, which require large amounts of steam and warm water in their finishing processes, and so can make use of the waste heat from the generation of power, and similar mills.

There is, roughly, 1 1-4 million h. p. used by the cotton mills, and about 1-3 of a million h. p. used in the woolen and worsted mills in this country.

Steam Power.

Nearly all values and cost of power are at the present time compared with the cost of producing power with steam. All of the statements of cost which follow are based on present prices, and are subject to change from time to time, with the change in any element going to make up the totals. Prior to 1913 prices and costs were fairly constant; since 1913 they have increased so that today they are, roughly, double the 1913 prices.

An industry which is not yet established can, by using steam power, locate at any place where it seems desirable, but, if possible, the location should so be made as to warrant a supply of water, for boilers and condensers and for manufacturing purposes, if any is required.

In making up the cost of steam power, all charges have been considered, except interest and taxes on the cost of land. The fixed charges, including depreciation, interest, insurance and taxes have been assumed at 12.5 per cent, and the running time 50 weeks of 48 hours each, or 2,400 hours a year. In determining the cost per kw. h., it has been assumed that the average load for the running time is 90 per cent of the capacity of the plant. The cost of coal is assumed at $7.00 per long ton delivered in the coal pocket, and oil at $2.00 a barrel in tankage.

The principal items affecting the cost of steam power are as follows:

1. Cost of fuel delivered to boilers.
2. Amount of power produced.
3. Fixed charges on cost of plant.
4. Repairs and maintenance.
5. Attendance and supplies.
6. The net cost is reduced in some concerns where the waste heat of the power plant can be used in the manufacturing processes in the form of low pressure steam or warm water.

Cost of Steam Power Using Steam Turbines.

In most textile mills, the power plant will vary from 1,000 to 5,000 capacity. There will be some instances where the power used is less than 1,000 kilowatts, and some in which the power required will be more than 5,000 kilowatts, but, for the purposes of this paper, we have considered this range as sufficient for illustration.

For most textile mills requiring plants of less than 5,000 kilowatts, the installation of two-story boiler houses, mechanical stokers and mechanical coal-handling apparatus does not seem warranted to reduce the unit operating costs, which include fixed charges.

For a 5,000 kilowatt plant, the last two columns on Plate 1 show the differences in cost between a simple installation and the more complicated plant.

With modern plants, the following figures for cost of installation and operation are fair, when steam is not used for anything but power.

In many places mills run longer hours than 48 a week, and coal can be delivered at $4.00 a ton, and construction costs are less.

With 54 hours a week and $4.00 coal, and no change in cost of plant

Plate 1

Cost of Steam Power Using Steam Turbines in Textile Mill Plants
Operating 50 weeks of 48 hours each, or 2400 hours per year

Size of Plant in KW	1000	2000	3000	4000	5000	5000
Boiler house No. of stories	1	1	1	1	1	2
Type of Stokers	Hand	Hand	Hand	Hand	Hand	Mech.
Coal Handling Method	"	"	"	"	"	"
Cost of Plant per KW	$178	$152	$130	$120	$110	$133
Coal used lbs. per KWH	3.1	2.7	2.6	2.5	2.4	2.2
Power Cost burning Coal —Yearly cost per KW	$55.00	$47.00	$44.00	$41.00	$39.00	$38.00
Cost per KWH in cents	2.56	2.18	2.04	1.90	1.81	1.79
Power Cost burning Oil —Yearly cost per KW	$58.00	$48.50	$45.00	$42.00	$39.00	$43.00
Cost per KWH in cents	2.66	2.24	2.10	1.94	1.81	1.93

1,000 kw. could operate at $47.44 a kw., or 1.95c. a kw. h., all costs included, and 5,000 kw. could operate at $33.40 a kw., or 1.37c. a kw. h., all all costs included.

Effect of Use of Waste Products.

It has been common practice for many years to use exhaust steam of non-condensing engines and steam from the receivers of compound engines for manufacturing purposes, and for heating buildings.

The saving by the use of exhaust steam, which would otherwise go to waste, is considerable. In some mills, especially colored mills, if the power is not produced by steam, so that the low pressure steam can be used for manufacturing purposes, it would be necessary to maintain a boiler plant of sufficient size to produce an equivalent amount of exhaust or receiver steam thus used.

The bleeder type of steam turbine lends itself to this manner of running better than the reciprocating steam engine, and supplies steam free from oil for process work.

In addition to savings in coal there is some saving in fixed charges on a portion of the boiler plant, and attendance in the boiler house.

The reduction effected by the use of low-pressure steam upon the net cost is shown approximately in the following table, Plate 2.

Plate 2

Coal at $7.00 a long ton

Per Cent of Steam Used	Per Kilowat Year	Per Kilowat Hour
25	$7.00 to $10.00	0.33 to 0.45 cents
50	12.50 to 13.50	0.58 to 0.63 cents
75	18.00 to 23.50	0.85 to 1.10 cents
100	23.50 to 30.50	1.08 to 1.42 cents

Water Power.

The cost and, consequently, value of water power depends upon a variety of factors, but the essential fact is, whether, considering the combined result of all these factors, power can be produced and delivered as cheaply in this manner as by any other method.

The chief items affecting the cost and value of water power are as fallows:

1. The quantity of water and the uniformity of flow during the year or a succession of years.

A power whose flow is constant is the most valuable.

If the flow is variable, it must be supplemented by steam or other power, and the value diminishes as the needs of supplementary power increases. The variability may be so excessive as to make the cost of maintaining and running a double plant more expensive than it would be to produce the same amount of power by steam power alone.

2. The power which can be derived from a definite quantity of water increases directly in proportion to the head, and the cost of development increases per horse power as the head diminishes.

3. The location of the power has a large effect upon the value, but as stated before, the ability to transmit power electrically has rendered useful and of value many powers which otherwise would be valueless. It is now possible, in many cases, to so locate a mill as to get the desirable features and to run it electrically by water power, but even in such a case, the location of the water water power has a large effect upon its value, for the cost of transmission lines will be greater for larger distances to be run and the line losses greater.

4. The use of exhaust and overflow water from the condenser for manufacturing purposes tends to reduce the ten cost of steam power and therefore to reduce the value of water power for this particular use.

The chief items in the yearly cost of power are:

1. Fixed charges as interest, depreciation, insurance and taxes on the development.

2. Repairs and maintenance.

3. The cost of supplementary power, if any is necessary to make up for the fluctuation in water power.

4. Attendance and supplies.

Cost of Hydro-electric Power.

No definite sum can be fixed as the cost of water power, as this depends largely upon the conditions which affect the cost of the development. Each case must be considered on its own merits. As the chief cost of the development, the first cost is the most important item for consideration.

In a development substantially made, the fixed charges for interest, and the repairs may be as low as 9 per cent with a short transmission line, to 12 per cent with a long line. For the purpose of this paper, they are assumed at 10 per cent.

One hundred dollars a kilowatt would be considered a low-cost development. The cost in most instances would be greater than this, and some developments have been made in which the cost has been so great that it has been impossible to make it a paying investment until the capital charges are scaled down.

A uniform power development at reasonable cost is a valuable asset, which bids fair to increase in value as time goes on. A uniform power at high cost may not be profitable. A varying power at high cost is pretty sure not to be profitable.

The following table, Plate 3, shows in a general way the cost of power under varying conditions of construction cost.

depreciation, insurance and taxes,

Plate 3

Approximate Cost of Uniform Hydro-Electric Power Delivered at Power Plant Switchboard

Size of Plant in Kilowatts	1000	2000	3000	4000	5000
Assumed cost per KW	$100.00	$100.00	$100.00	$100.00	$100.00
Yearly cost per KW	14.00	13.25	12.50	11.75	11.00
Cost per Kilowatt hour in cts.	0.65	0.61	0.57	0.53	0.50
Assumed cost per KW	$200.00	$200.00	$200.00	$200.00	$200.00
Yearly cost per KW	25.00	24.35	23.45	22.60	21.75
Cost per Kilowatt hour in cts.	1.17	1.13	1.09	1.05	1.50
Assumed cost per KW	$300.00	$300.00	$300.00	$300.00	$300.00
Yearly cost per KW	36.20	35.30	34.40	33.55	32.65
Cost per Kilowatt hour in cts.	1.70	1.65	1.60	1.55	1.50

The above costs are for current on the switchboard in the generating station. The effect of transmission losses is to increase the cost of power delivered to the mill in proportion to the percentage of loss on the transmission lines. These losses for short lines would be, roughly, 5 per cent, and for long lines 10 per cent.

Adding 10 per cent to the last set of figures in the preceding table, we have shown on Plate 3-A the approximate cost at the end of the line, assuming the cost of plant and line at $300 a kilowatt.

Effect of Variable Power.

That portion of the power which is uniform, and which can be depended upon all of the time, is called "permanent power" or "primary power," and that power which is variable, and cannot be furnished all the time, is called "surplus or secondary power."

Plate 3—A

Approximate Cost of Uniform Hydro-Electric Power Delivered at Consumer's End of Transmission Line.

Size of Plant in KW	1000	2000	3000	4000	5000
Yearly cost per KW	$39.80	$38.80	$37.80	$36.90	$35.90
Cost per Kilowatt hour in cts.	1.87	1.82	1.76	1.71	1.65

It is the latter kind of power which we will now discuss.

Te effect of variable power is the necessity of a supplementary plant of sufficient capacity to make up the deficiency purpose.

In some few instances, the variation of flow is so great that the extreme low flow is insufficient to generate any useful power, and sometimes the backwater may be so great as to reduce the working head to such an extent to make it useless for power. In such cases as these, it would be necessary to maintain a supplementary plant of the same capacity as the primary plant, costing, roughly, three-quarters as much per kilowatt as given for regular steam power; for the purpose of discussion, say $100 a kilowatt.

Usually there is some permanent useful power in all developments, but all power developed above the permanent must be supplemented as stated above, if it is desired to produce continuous power, and there are very few industries which can succeed unless they can be run continuously.

The fixed charges on the supplementary plant would go on, whether this plant was used or not, at 12.5 per cent, or $12.50 per kilowatt year. To this must be added the cost of operating, which, under a varying load, would be less economical than regular steam power, and would cost from $2.30 to $3.25 per kilowatt a month.

The total cost of power in such cases would be approximately as is shown in the following table, Plate 4:

Plate 4

Approximate Cost of Variable Hydro-Electric Power.

Power costs per Kilowatt per year, for Hydro-Electric Plants having Steam Auxiliary Power Plants.

Hydro-Electric Plant Size of Plant in KW	1000	2000	3000	4000	5000
Cost of Hydro-Electric Plant per KW	$200	$200	$200	$200	$200
Yearly Cost per KW	$25.00	$24.35	$23.45	$22.50	$21.75
Auxiliary Steam Plant					
Yearly fixed charges per KW	12.50	12.50	12.50	12.50	12.50
Operating Cost ea. mo. per KW	3.25	2.75	2.50	2.40	2.30
Total Yearly Power Cost per KW. when					
Steam plants runs 1 month	40.75	39.50	38.45	37.50	36.55
Steam plant runs 5 months	53.75	50.60	48.45	47.00	45.75

Every $100 increase in the cost of the hydro-electric development adds $10 a year in fixed charges to the cost of power per kilowatt.

Thus a 1,000-kilowatt for steady power. If supplemented by steam to its full capacity for five months, the total cost of power would be $53.75. If the cost is $300 a kw., including transmission, the yearly cost, if supplemented full for five months, would be $65. plus .90 equals about $72 delivered.

In order to determine whether a water power should be developed, and the extent to which it should be developed, a comparison of the total cost of producing the amount of power required by the water power supplemented, if necessary, by steam power or purchased electric current, should be made, with the cost of producing the same amount of power by steam alone, or purchasing all of it.

The cost of the water power and the supplementary power must not be more than the cost of steam power alone or purchased current alone.

If considerable quantities of steam or warm water can be used in the manufacturing processes, the

(Continued on Page 35)

Bleaching of Sized Fabrics

IN order to understand what happens in the bleaching process, and to be able to control the conditions therein so that the proper results are otbained, it is essential first to know what the cellulose material contains when it is ready to enter the bleaching kier and also the effect of the bleaching agents on each one of these ingredients. This by no means excludes the cellulose itself, for it is a well-known fact that the bleach liquor will have a certain effect on the cellulose itself even under the most favorable conditions, and when the process is properly carried out a much-impaired fiber will be found in the finished goods, says Ismar Ginsberg in the Textile Colorist.

This problem concerns not only the natural constituents of the cellulose fiber, which may be defined as waxes, proteins, mineral matters, pectic matters, coloring matters and finally cellulose, but also the various foreign matters that are added to the cotton fiber during its manufacturing process. Hence, the effect of the bleach on these ingredients is an important matter, for it will follow that if the active bleaching chemical has but little effect on these substances, as they are found in the cotton fiber after being put through the preliminary treatments before the actual bleaching process is commenced, then the final results will not be a satisfactorily bleached fabric.

Inasmuch as the common bleaching agent that is employed for this purpose is chlorine either in the form of bleaching powder or as chlorine water or liquefied chlorine, the problem narrows down to the action of chlorine on these natural and artificial ingredients of the cellulose fiber.

The prime object of bleaching is the removal of the non-cellulose constituents of the cotton fiber, no matter what the origin of these constituents may be. The various processes in the bleaching of cotton fabrics need not be described here, for they are well known, although their effect on the ingredients of the cotton fiber may not be so well appreciated by the practical bleacher.

There is one ingredient in the cellulose fiber, found both in cotton and in linen, whose removal has caused a lot of discussion, and that is the waxes. It has been shown by various investigators that the waxes are by no means entirely removed by the treatments to which the cotton and linen fabrics are subjected during the bleaching process. On the other hand, experiments have also shown that there is a gradual removal of these substances as the bleaching progresses. The effectiveness of the lime boil is a matter of argument in this case. Some hold that the lime boil does nothing more than saponify the waxes and does not remove them. The again there is a portion of the waxes which are not saponified, and, furthermore, the lime soap that is formed in the saponification also sticks to the fibers. The supplanting of lime boiling by caustic as a treatment has been advocated by many textile men, but it follows that the lime boil process is particularly well suited for treating certain classes of goods. In spite of what might appear on superficial examination it is a fact that the ime boil is the best suited treatment for removing the waxy substances from the cotton and the linen fiber, for after the lime boil and the subsequent sour there are both free fatty acids and unsaponifiable matters on the fibers and the subsequent treatment with alkali in the lye boil results in the rapid formation of a soluble soap with the free fatty, acids, and thereafter it is a very easy matter for the unsaponifiable portion of the waxes to be removed by emulsification.

The emulsifying action of the soap thus formed on the insolube unsaponifiable matter has been discussed by various investigators, and the reader may be referred to the article in the Journal of Textile Institute, 1916, volume 7, page 30, and in the Journal of the Society of Dyers and Colorists, 1918, volume 34, page 137, as well as to the Bulletin Societe Industrielle Mulhouse, 1913, volume 83, pages 510ff.

In passing it might be mentioned that the use of volatile solvents for the removal of the waxy matters in linen has been investigated as well and a number of patents have been obtained on this procses.

As far as the action of hypochlorites on the waxes, which is similar to the action of free chlorine, it may be said that "cream" linen yarn was found to contain 1.21 per cent of wax which was apparently little different from the original wax. But when the wax had been subjected to saponification, it was found that it contained as high as sixty per cent of saponifiable matter. Thus the action of the chlorine was to change the wax into products which yield more to saponification. This explains the contention that has been held by bleachers that the chemicking prepares the cloth for the removal of impurities in the subsequent boil. The same results were obtained with cotton cloth, and it was observed that a white solid was formed during the treatment with potassium hydroxide solution in alcohol. This compound was afterwards identified to be potassium chloride, formed by the union of potassium hydroxide and the chlorine in the chlorinated wax.

The cotton fiber contains a certain amount of natural protein matters. In the hydrolysis of proteins, which is the way they are broken up into simpler products and finally removed, there is always present the odor of ammonia, for the proteins will be broken down in part to this gas and carbon dioxide. Thus when the cotton materials are being subjected to the various alkali boils in the boils in the bleachery, there is always a distinct odor of ammonia around the kiers, and this is explained by the decomposition that is being carried out on the protein matter in the cotton fiber. There may also be some sulphur combined with these proteins and the removal of the sulphur is accomplished by the action of alkalies which convert it into soluble alkali sulphides.

It has been found that cotton will contain on an average a quarter of a per cent of nitrogen, and the treatment with sodium hydroxide lyes materially reduces the amount of nitrogen in the boiled-off cotton. It was found that while lime-boiling will hydrolyze both the natural nitrogen present in the cotton as well as the nitrogen in the sizing materials that are added to the cotton in sizing warp yarns, nevertheless this method is by no means so effective as a soda boil in removing the nitrogeneous compounds for the reason that the lime treatment gives products that are not completely soluble. Steeping in acids is also only partly effective in removing the nitrogeneous substances.

It is interesting to note that nitrogen contents of cotton piece goods containing flour sizes are higher than in the case of linen goods, for the latter are never sized with substances which have a high nitrogen content.

When considering the effect of bleach liquors on cotton fabrics which contains sizes, it is understandable that what really is being studied is the action that chlorine has on starches, for starches are the principal ingredients of the sizing compositions that are usually empolyed on cotton goods. It is, however, a fact that there has been but little investigation of this rather important matter. Of course, the reaction between starch and iodine is well known, but it is not at all certain what takes place—that is, whether or not a definite chemical compound is formed. Iodine is perhaps the only one of the halogens, of which chlorine is the most important member, whose action on starch has really been given any considerable attention. On the other hand, when the literature is examined to see what has been published regarding the action of chlorine and bromine on starch it is found stated that these halogens are without any action whatsoever on starch that is absolutely dry. There are, however, certain patents which have been issued on processes for converting starch into the soluble state which are based on the action of dry chlorine on the carbohydrates. For example, there are the German patents Nos. 149,588 and 168,980. It has also been stated that bromine in the presence of water will yield an orange-colored compound with starch. The combination includes starch, hydrobromic acid and bromine. Then, gain, hypochlorites have been used for decomposing starches and this reaction can be brought to a close by cooking. At the boiling temperature the hypochlorites are converted into chlorates and chloride which are no longer reactive. At still higher temperatures the halogens have a strong oxidizing action and decompose the high molecular weight starch molecule. All these reactions are of no great importance to the scientist and have not been studied to work out their more exact conditions, for starch is not a homogeneous chemical substance but consists at least of two carbohydrates. The chemists who are scientifically inclined work rather with substances which have definite chemical constitution.

On the other hand, for the practical man who is concerned with the bleaching, a knowledge of the axact action that chlorine has no starch is of considerable importance. It has been shown that bromine has an action on starch, and hence it follows that chlorine, which is chemically more active than bromine has an action on starch, and hence it follows that chlorine, which is chemically more active than bromine, will have even a stronger action on the carbohydrate. It has been observed, for example, that goods which have not been thoroughly desized possess the property of holding chlorine very tenaciously, and even when these goods are treated with antichlors it is a very difficult matter indeed to free the fabrics completely from chlorine. It would naturally appear from these facts that starch may enter into some sort of a chemical combination with chlorine.

It is for this reason that the experiments which are described in Melliand's Textilbeichte, 1925, pages 23 ff, were undertaken. In these experiments it was first sought to determine the chlorine content of the goods. The ordinary methods which are used for this purpose could not be used, for the reason that the proportion of chlorine which was present in the fabrcis was very small Micro-analytical methods could not be used because of lack of a suitable balance, and therefore the chlorine content was determined nephelometrically. The detemination was made in such a manner that a solution which contained chlorine in the form of chloride was precipitated with a solution of nitrate of silver which was weakly acid with nitric acid, and the degree of precipitation was determined with the aid of a standard solution of known chlorine content. The chlorine content was thus established by the density of the turbidity which formed in the reagent vessel when the two solutions were brought together. A preliminary test showed that a difference of ten per cent in chlorine content would be easily detected in this manner, while five per cent gave only a slight difference.

In the orginal article there are given considerable details regarding the exact methods that were employed in preparing the solutions and in carrying out the test. One essential

(Continued on Page 33)

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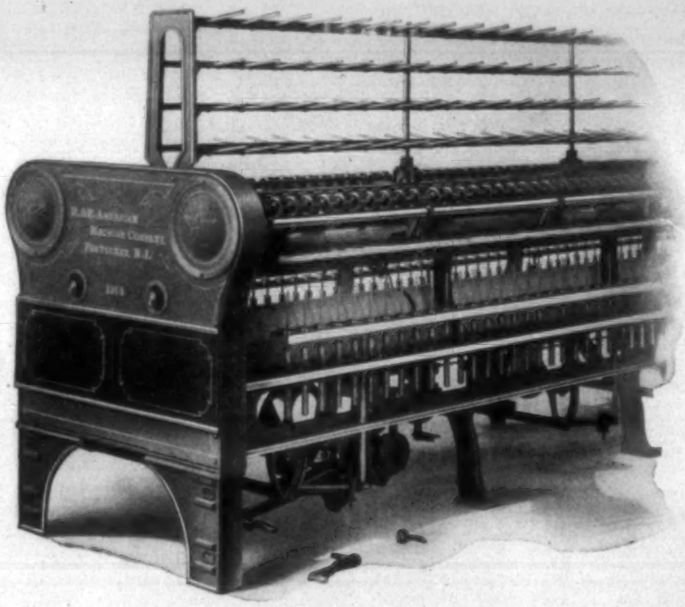

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International Fabric Exposition

PLANS for the most interesting fabric exposition ever held in America are now in the making. On February 22, 1926, Washington's Birthday, the great doors of Grand Central Palace, New York, will be thrown open to welcome merchants and buyers and the general public to the International Fabric Exposition and Merchants' Conference where vast textile achievements will be on display. The exposition, which is under the personal direction of Charles H. Green, widely known as a director of expositions, will include exhibits from many famous silk, cotton, wool, rayon and linen mills.

It is expected that because of two distinct appeals, the artistic and the practical, the International Fabric Exposition will create wide interest and attract visitors from all parts of the United States. Those who worship the artistic will catch their breath in admiration at the magnificent spectacle of gorgeous textiles on display at the exposition—textiles representative of the finest fabric achievements of five industries.

It was with a view to making this fabric exposition a great artistic triumph that Managing Director Charles H. Green, accompanied by Walter T. Sweatt, Director of Exhibits and Howard Greenly, Director of Decorations, made a recent journey to Europe to study methods of presentation employed at the Wembly Fair in England and l'Exposition d'Arts Decoratifs in Paris. The fact that Howard Greenley, A. I. A., ex-president of the Architectural League of New York, has been chosen Director of Decorations also lends a great deal of artistic significance. Mr. Greenley's decorations for the International Silk Expositions, the Architectural and Allied Arts Exposition and others will not soon be forgotten.

But not for the sake of art alone was this great fabric exposition planned, rather to bring art and industry together, and act as a source of nispiration to retailers, buyers, merchandise men, manufacturers interested in textiles; to give them an opportunity to exchange ideas; to get perspective on their own work, their own merchandise; and to give them vision in planning for the future. That, according to Mr. Green, is the most important thing such an exposition can do.

"The man who has kept his eyes too closely on his own task or his own goods" says Mr. Green, "cannot help but feel an involuntary expansion of vision when he finds spread before him, the very finest of the world's fabrics, displayed in perfect harmony of color and line."

With this idea in mind the program of the International Fabric Exposition has been planned to include daily demonstrations in practical merchandising — how goods will include a series of luncheon conferences at which leading manufacturers and retailers will discuss common problems of the industry; also a series of demonstrations showing how store events in fabric departments may be worked out.

One of the most interesting features of the exposition will be an educational exhibit of silk. A complete manufacturing unit will be installed under the auspices of the Chamber of Commerce and the Broad Silk Manufacturers Association of Paterson, New Jersey. This exhibit will show the various processes of silk production from the reeling of silk from cocoons to finished broad silks, ribbons, etc. It will enable visitors to see in one sweep all the essential intricacies of reeling, spinning, designing, weaving and dyeing of beautiful silk fabrics.

Cotton will be adequately represented. Many of the largest producers of fancy cotton goods will have exhibits.

Rayon, (artificial silk) the newest of all materials, now as an established position in the fabric world and will be generously represented at the exposition by the leading producers of rayon and rayon fabrics.

Exhibits of woolens and linens will form a most attractive division of the exposition which will include the high spots of each of these five fabric industries.

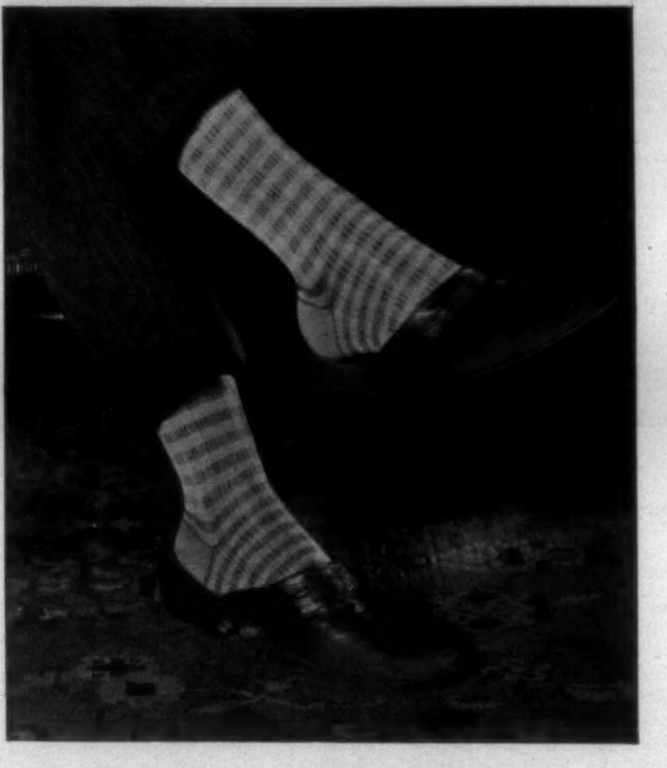
A feature that will be highly appreciated by the general public, will be a pageant showing "Fabric Fashions of Interest" made from materials exhibited, by leading couturieres and shown on beautiful mannequins in the large court located in the center of the main floor.

The exposition will be open in the mornings for the trade only; and as a feature of the morning session a style show will be given at 10 o'clock. To the general public the exposition will be open at 1 o'clock daily expect Sunday, and will include a style pageant at 4 p.m. and 9 p.m.

The International Fabric Exposition is an inspirational presentation of the beautiful and practical things in fabrics. It is not a market place to buy and sell. That is the aftermath, the action following the inspiration, to be carried on in the show rooms and offices of New York's great fabric houses.

Statistics of Danish Knit-Goods Industry Reported.

The knit-goods industry in Denmark is steadily growing, according to statistics recently published by the Danish Industrial Board, reports Consul E. A. Johnson, Copenhagen. In 1924, Denmark had 70 knit-goods mills which employed 2,635 people. In addition, almost 1,000 home workers were engaged in this industry. The production of all classes of knit goods in 1924 aggregated 2,256 mertic tons valued at almost 36,000,000 kroner (kroner equals $0.1672 in 1924) compared with 2,191 metric tons of the principal classes of goods produced in 1924 was as follows: Hosiery, pure wool, 374; half wool 58; half wool 262; cotton 904; rayon 8; other knit goods pure wool 406; half wool 43; cotton 130; rayon 1. Imports of knit goods of all kinds amounted to 646 metric tons in 1924 against 866 in 1923, the principal decline being in cotton knit goods.



The above photograph gives some idea of the extraordinary beauty and originality of the new Ipswich hosiery. But it can give no idea of the striking and permanent luster which is imparted to this hosiery by Celanese brand yarn.

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Propose Uniform Standards for Dye Testing

CORRESPONDENCE is being carried on at the present time between the American Association of Textile Chemists and Colorists and the Society of Dyers & Colorists of England, with the object of considering the possibilities of establishing a uniform set of standard methods of dye testing for both England and America.

This information is contained in the annual report of the Research Committee of the American association and printed in the recently issued 1925 year book of the organization.

Prof. Louis A. Olney, president of the association, states in his committee report that while the requirements of the textile and color industries of England vary somewhat from those of America, they are essentially the same. "If it is found possible to work out such a set of international standards," he comments, "they would undoubtedly prove of great value to both countries."

Methods of Dye Testing.

The Association's Standard Method of Dye Testing occupy a prominent place in the 1925 Year Book. A number of new revisions have been made and several new tests introduced. Briefly, the test methods cover dyed and printed cotton; dyed wool and dyed silk.

The specific tests devised for dyed and printed cotton deal with fastness to washing; fastness to fulling and fastness to chlorine. During the last 12 months a sub-committee headed by Wm. H. Cady of the Pacific Print Works has continued a search for a practical standardized mehtod of determining fastness of dye to light. "The problem is still far from being solved," says Mr. Cady, in explaining three different lines along which the investigation is proceeding.

There is also a report on the committee on "Fastness to Perspiration," and methods for testing the fastness of colors on wool to "Dry and Wet Heat," "Fastness to Carbonizing," "Fastness to Acids and Alkalies" and "Fastness to Set Water."

Considering the Consumer.

Professor Olney says it is the intention of the Research Committee to test various dyestuffs as rapidly as may be possible, beginning with those most commonly used. Elsewhere in his report he states that "the viewpoint of the consumer of dyed textile material has been carefully considered whatever the committee has felt that this was important."

In this connection, Professor Olney explains:

"It must be remembered that many of the important tests, as, for instance, those for fulling, carbonizing and steaming, are of no interest whatever to anyone by the manufacturer, since the ability of colors to stand up under these requirements is settled one way or the other before the goods leave the mill."

In order that all the methods proposed up to the present time may be tried out under varying conditions of personal manipulation and different requirements, the committee is submitting a set of samples to 10 outside testing agencies. These agencies were selected so as to cover textile manufacturers, dyed distrib-

"These criticisms and suggestions will be finally considered and the results of the individual testers carefully compared and, with this information in hand, it is believed that our standard methods may be put upon a more ermanent basis."

In view of the movement being headed by the Converters' Associatm to establish standard definitions of fastness, the report of the subcommittee on light fastness makes interesting reading to the laymen. It is reprinted below:

Report on Fastness to Light.

"1—An attempt is being made to measure the fading power of the sun from day to day by means of the barium photo-electric cell of the Case Research Laboratory. If it is found that there is a direct parallel between the fading rate of various dyes and the intensity of the sun's light as measured by the barium cell .regardless of weather conditions or the time of year, this device may find considerable use in this connection as a check on the sun's varying activity.

"2—Experiments are in progress to determine the effect on sun fading of variations in the mechanical details of the exposure, such as the angle at which the samples are to be exposed, the presence or absence of a protecting glass and of an air space between glass and sample, variations in the locality of the exposure, etc. Since sun fading in the long run is the only universally accepted method of determining light fastness, and since hardly any two persons expose samples to the sun in the same manner, it is important to know to what extent these variations are likely to influence the results.

"3—Further trials are being made in various artificial lamps, such as the violet carbon are ('Fade-ofeter,), the mercury vapor arc with glass shield ('Uviarc'), and the nitrogen-filled tungsten lamp corrected by copper sulfate solution, to determine which of these devices is capable of giving the closest approximation to sunlight in its fading action on dyes.

"The problem is a hard one, and is made more so by the practical impossibility of measuring accurately the total amount of fading of dyed samples, some of which grow lighter on exposure, some grow darker, while others change to an entirely different color.

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Advantages of Oiling Cotton

SPEAKING before the meeting of the American Association of Textile Chemists, Everett H. Hinckley, of Borne, Scrymser Company, spoke on the subject of oiling cotton. According to Mr. Hinckley, there are numerous advantages in oiling cotton.

In the first place, he stated, it emulsifies the wax and other emulsifiable material in the cotton. When the oiled cotton has been carried through its various operations the tendency is to bring other impurities to the surface, the cotton acting as a sort of a wick to the oil. Oiling cotton has the advantage of cutting static electricity, this having been proven by a test made by the insurance companies. Another thing noticed is that dry cotton will take less oil than cotton having its natural moisture. It also will permit of more twist being put into the yarn without decreasing its breaking strength. The application can best be made on cotton in the open state, that means in the opening room. Dyed raw stock can be oiled quite as well as clean stock and the same improvement will be noted. But it is essential that the oil be evenly sprayed since if there are some dry spots it will act as though it had not been oiled. Originally for that purpose single acting pumps were used and not found to be fully satisfactory. Now the double acting-sprayers are found to very evenly oil the stock.

When the oil was first tried in one Southern mill it was applied to two rows of cards out of five rows backed by a picker in each row. On those two rows it was found that the atmosphere was as clear of lint as though a knife had cut through the air at that point, while on the other three rows of cards the air was as full of lint as is usually the case in the average cotton mill. This would seem to indicate that the oil acts as a binder or suction to hold the lint on the stock throughout the intermediate operations because it has been found in practice that there is a gain of about two per cent. in the finished weight of the stock.

Emulsified Oil.

The oil now put out by the Borne, Scrymser Company is the result of long experiment. When the company began to experiment it tried out both vegetable and mineral oils, and after an exhaustive investigation came to the conclusion that an emulsifiable mineral oil, free of acid and containing sufficient lubricating qualities and body, but not too much of either, was the oil required. Oil containing acid is was found sooner or later dulled the wire of the card clothing and if too thin of consistency was inclined to run between the wires, thereby working through into the back of the card clothing and loosening the backing.

The present oil overcomes all these defects by slowing up around the wire and being of sufficient body not to work back of the card clothing and containing no acid cannot injure the wire.

An emulsifiable oil used in preference to a saponifiable oil because, in the case of the latter, it is simply a detergent and as a tendency to act much slower than an emulsifiable oil. Then again an emulsifiable carries everything along with it as it works away. On the other hand, because of the slow action of a saponifiable oil it might cause discoloration of the stock or create a rancid condition of the stock after laying around a while, whereas an emulsifiable oil, as already stated, has the tendency to bring all impurities to the surface which a light scouring will remove.

In bleaching operation oiling of cotton does not effect its bleaching qualities. If anything it gives a clearer white which will not yellow quite so quickly as is the case when no oil is used. Neither does it disturb the dyeing operation even if the oil is left in. In proof of this two samples of dyed khaki were shown. One dyed with stock not oiled. While two samples were dyed at different time no difference could be seen in the levelness of the dyeing.

Small Amount Needed.

When experiments were first begun various percentages of oil were used on the stock. It was finally found out that less than one per cent. of oil per hundred pounds of cotton was sufficient. In fact to be exact 3-4 of one per cent. is the generally accepted proportion, with a wide variation within this narrow limit, all depending upon the class of stock.

A while back, tire yarn manufacturers were inclined to think that oiling of their stock would be detrimental to the use of such yarns in tire making. But reports from tire manufacturers proved a revelation. Tests showed that oiled stock gave an increase in elasticity of not less than 100 per cent. which means double the life of a tire because of the ability of the oil in the cotton fibres in the yarn to much better withstand the cutting operation caused by the constant bending of them as they lay and weave over each within the layers of rubber. Another thing, cards have to be set closer for oiled cotton.

Names New City Dukeville.

Spencer, N. C.—Dukeville is the name of the new town being built by the Southern Power Co. on the banks of the Yadkin river adjacent to Spencer, where the big steam electric power development is under way. The town is named Dukeville in honor of the late J. B. Duke, who was head of the concern which is constructing the 100,000 horsepower development.

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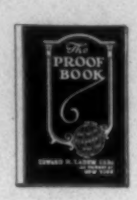

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Origin and Removal of Stains

WHEREVER dyeing and bleaching are carried out the danger of spots and stains exists, each peculiar mark having its own possibilities. In this article it is intended to treat first with the kind of the stain, its origin and the possible prevention, and then discuss methods of removal, says W. B. Nanson in the Textile American.

When any stain or peculiar marking appears on the pieces, it is obvious that the fault must be removed, which means an extra expense in chemicals and labor, besides the danger of damaging the fabric. It stands to reason that the fewer the stains the greater the efficiency of the works. Before any stain can be satisfactorily removed one must have some idea as to the nature of the damage under treatment, else there will be a considerable waste of time. It is futile to try and remove some stains by haphazard treatment, trying first one solvent, then another, until one is fortunate enough to employ the correct method. Not only is it necessary to remove the stain, but at the same time, one must proceed further and discover, if possible, the cause of such stain and try to prevent its occurrence in the future.

Stains and their causes can be roughly divided into two classes:—(a) External or mechanical stains; (b) Internal stains, or stains produced in the process. In the first class are included stains not produced by the process itself but caused by some external source, in fact, what might be described as mechanically caused. In the second category are included stains caused by some fault in the process itself and not the result of external agencies.

External or Mechanical Stains.

These include: oil marks, grease, wax, paint, tar, dyestuff particles, dirty oil from shafting and bearings, iron mould and mildew.

Certain oil stains have their origin in the weaving department. These markings which occur in the weaving shed, where a stainless oil has been used, should cause little trouble as they ought to disappear in the subsequent bleaching process or cover up in the dyeing, that is on the supposition that the oil is stainless, but the oil is seldom stainless to the end, and therefore it is always advisable to color the oil used either in the spinning or weave rooms a light pink either with Magenta or some other color that will easily bleach out in the subsequent bleaching (for this is written for bleachers and dyers only) in order that it will show plainly after weaving and thus allow it to be easily picked out and washed out before bleaching. This may be done by soaking, first—the stain in oil, then washing the whole stain previous to bleaching and get it thoroughly out.

These oil stains, especially in quilts, are very common and are usually derived from the spilling or accidental throwing of oil from the machinery used either in the spinning or weaving process. The exact period when they have been produced is rather difficult to tell. They (the stains) will not show, until the oil is first dyed pink until after the cotton goods are finished into white (i. e., bleached) when they become fast yellow.

If they are in the spinning the stains are mostly confined to either the warp or weft of the fabric, but, in the case of the weaving stains they are more patchy and may either be on the warp only or on both the weft and the warp, or may have been produced on the cloth while it was being finished. When the cloth is stained during weaving or before (i. e., before bleaching) the oil itself may be removed during the process of bleaching; although in some cases the stains may be removed, it is not always so; in some cases they remain on the cloth and the innocent finisher (or dyer) gets the blame for them.

The great trouble is that the oil will not remain stainless even if it comes out and may have lost its original innocuous character, it may possibly have become mixed up with iron and brass in a finely divided condition from the machine bearing and shafting on the looms and in other places and appears on the pieces in dark and greasy patches. If microscopically examined, the character of such a stain will be clearly visible.

When the bleaching is over, probably the stain has disappeared; but possibly when the stain originally existed, **the piece has** become tendered and a hole develops on passing through the water mangles. If this place be examined carefully under the microscope one perhaps will notice finely divided particles of iron and brass adhering to the fabric. **These are the cause** of the damage. Finely divided metals such as iron and copper as well as nail heads possess the property of evolving oxygen from bleaching liquor solutions. In the actual process of bleaching the cloth becomes ten-

(Continued on Page 34)

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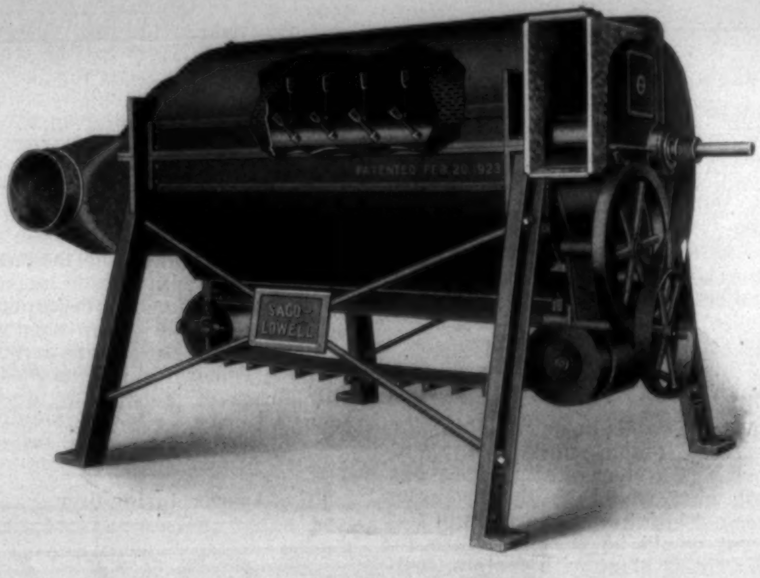

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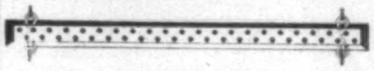

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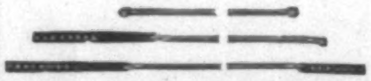

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Practical Discussions
By
Practical Men

Weave Room Production.

Editor:

Will some good weaver or superintendent give me a list of things that will help to get the very best production possible in a weave room.

510.

Two-Ply Belts.

Editor:

Will a two-ply belt give more production on an overhead drive in a weave room? It is a question in my mind. I will appreciate it if someone who has had experience with this wil let me hear from them. It seems to me that a single ply belt stretches and gets too lights for the best results.

New Overseer.

Cost of Mill Building.

Editor:

What would a modern biulding for a 3000 spindle mill cost. With sprinkler system, steam pipes, etc., and what wuold be the necessary macinery for hosiery yarns 8s to 14s? What would be a close figure for this entire plant with motors, belting, etc.

"Ala."

Twist in Roving.

Editor:

As I may be expected to start a cord room in a new mill, I want to get posted on roving twists. I never started new machinery before, and as I understand the general rules given in the books are only a skeleton around which to build the real thing. What is the best way to find the "happy medium" twist?

Mover.

Operating Costs.

Editor:

Kindly ask your readers to answer the following questions: What should be a proper cost per spindle annually for supplies and repairs to efficiently operate a 13,000 spindle mill with 336 40-inch automatic looms, day and night on print cloth.

Kindly estimate each necessary material of expense in operation, considering electrical equipment, purchased power, only boiler for heating purposes. Cost should include every item of expense necessary for full operation, eliminating fuel.

M. J. V.

Answer to Go Getter.

Editor:

Yes there is a substitute found for slasher cloth. It is now possible to operate slashers without the use of the time honored blanket which has beld forth since the advent of the slasher itself. Instead of using wool or union blankets, it is now possible to substitute for the bianket, a special yarn which is wound onto the slasher squeeze rolls. You start to wind it at one end and the other end of the yarn runs tail at the other end of the roll. Three or four, or more layers can be wound on and the roll is ready for use. The claim is that a big saving is brought about and that a better quality of slashing is the result. You see yarn is cheaper than cloth. And the squeeze roll is perfectly round when wound with yarn. It is said that the squeeze rolls wound with cloth will cause a variation in the loading of the yarn web with size or moisture of 50 per cent in one revolution of the squeeze rolls whereas when yarn covered rolls are used, the variation is much reduced and a more even distribution of moisture is brought about. You better look this up.

New Game.

Answer to Inquirer.

Editor:

I take it that the spinning frame in question cannot be turned around because the cylinder would run the wrong way, and that you want to change the driving end to the foot end of the frame. If this is so, you will find, that, as a rule, the head samson of the frames can be exchanged for the foot samson. If this is so, proceed to swap samsons and reverse the gearing and pulley end. Some spinning frames have the same kind of a samson at each end of the frame.

C. S. Q.

Answer to Stock.

Editor:

It is always best to keep all textile stocks moving, and to turn over often the surplus stocks required to replenish machines, etc. It does not do any yarn any good to keep it around idle for any great length of time. Of course, much depends on the kind of yarns, and the put up, as well as the finish through which yarns have passed. Some time ago a loom warp in one of our textile schools "ran out" in good shape right upto the last. It was used for sample weaving. It is said that this warp was started by a student who graduated from this school nearly 30 years ago This speaks mightly well for the atmospheric conditions as kept up and supervised in this school. When it is considered that all yarns are so much affected by the tempatures, humidities, sizings, finishes,

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strains, mildews, rodents, sunlight and certain insects, this yarn which was kept in such good working condition for 30 years is a record indeed for even a textile school.

North.

Eliminating Drop Wire Difficulties

In handling rayon it has been found that exceptional smoothness and polish are essential in all parts of machinery and equipment with which the rayon fibres come in contact. Pressure against it and rough-ended surface causes thread breakage and consequent trouble and poor results in weaving and finishing. Some mills have reported that they found a great deal of difficulty in having operatives handle more than two or three looms on rayon, due to excessive breakage.

The Mossberg Pressed Steel Corporation, of Attleboro, Mass., has recntly devoted considerable study to this question, and have recently perfected a "new process" drop wire for use in weaving rayon on looms with stop motions. The new drop wire is exceptionally round and smooth, and well polished. Consequently it tends to reduce rayon breakage and leads to much better results. The company cites the record of several mills which have recently been able, through the use of these drop wires, to materially increase the number of looms per weaver and to secure much better uniformity in the woven product.

The company also reports that it has worked out a further refinement in the manufacture of these drop wires that will lead to even better results when it is made available to the mills.

American Cotton Favored in Finland

The production of cotton spinning and weaving industry in Finland in 1924 was valued at 323,715,100 markkas as against a total of 420,0995,200 in 1923, Consul J. F. McGurk, Helsingfors, reports to the Department of Commerce. The exchange value of the markkas was $0.0268 in 1923 and $0.025 in 1924. The years, 1924, was in some degree a poorer one than 1923 for the cotton industry on account of the decreased buying power of the rural population, caused by the poor crops of 1923. Not only were fewer workers employed, but the mills operated on only part time during the spring.

The Cotton Mills Association, comprising six mills and constituting practically the whole of the cotton-manufacturing industry of Finland, states that the annual consumption of raw cotton by its members aggregates between 30,000 and 33,000 bales. Each mill purchases its own raw materials. The greater part of the cotton consumed, according to the Association, is of American origin. The import statistics, however, show only small quantities coming direct from the United States, the major portion being credited to Great Britain, Denmark, Germany, and other continental countries. Approximately 60 per cent of demand met by local industry.

The Finnish cotton mills have the capacity to produce sufficient quantities of certain goods to supply the entire domestic demand, but comparatively large sums are expended annually for imported materials. In 1924, during which the cotton mills worked under somewhat adverse conditions, imports of cotton fabrics were valued at 108,277, 925 markkas and of cotton yarns, cords, etc. at 35,781,205 markkas, the total representing about 44 per cent of the domestic production.

While foreign cotton goods of all kinds are sold in competition with the domestic product, large quantities also of finer qualities, such as dress goods of new styles and novel designs, draperies, curtain fabrics, etc., are purchased yearly from other countries. Of the imports of specified classes of cotton goods in 1924, totaling 1,072 metric tons, valued at 92,967,656 markkas, Great Britain furnished 599 tons with a value of 50,785,631 markkas and Germany, 113 tons, worth 12,036,484 markkas. Other important suppliers were Sweden, and the Netherlands.

With regard to terms of purchase, Finnish importers of cotton textile goods are in a far more favorable position than those doing business in other lines. While most of Finland's import trade is done on a basis of cash against documents, the rule prevailing and strictly followed in the textile branch provides for payments within 30 days from the end of invoice month less 2 1-2 per cent, or 90 days, net, the former being the most common usage. It is even reported that open credits of 6 months are granted in certain cases. The Wholesalers' Association of Finland explains that this situation is caused by keen competition, both on the part of domestic firms and foreign exporters of cotton goods.

Finnish cotton manufacturers distribute their goods almost wholly through wholesalers although exceptions are made in cases where former wholesale firms and customers of the mill are at present operating only retail stores. The profits of the wholesalers usually range from 5 to 7 per cent and of the retails between 10 and 12 per cent. The wholesalers usually quote 14 days, less 2 or 3 per cent discount, or 30 days net.

Col. Don E. Scott Entertains.

Graham, N. C.—Col. Don E. Scott, Sidney Mill manager in Graham entertained recently 200 employes, their wives, and children at a barbecue and brunswick stew on the mill premises. A. R. Heritage, mill superintendent, spoke briefly during the feast in behalf of the employes and what it meant to them to have the spirit of interest shown them. During past months, the mill has kept running day and night and there seems to be a close spirit of cooperation between employers and employes.

RAYON REEDS

On account of the ever-increasing use of Rayon (artificial silk) by Southern cotton mills, we are making a reed particularly adapted to the Rayon yarns.

Special attention is necessary to the finish on the wire used in these reeds, which finish requires approximately three times the length of time usually given to regular reed wire.

There is, however, absolutely no extra charge for this special finish as we invoice Rayon reeds at our regular standard prices.

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Appleton Will Ship 30,000 to Anderson

Anderson, S. C.—Plans for increasing the capacity of the recently acquired Brogon Mills, of this city, have been outlined by the Appleton Manufacturing Company, a subsidiary Massachusetts company formed by the Appleton Company, of Lowell, Mass., to operate the Southern mill. It is their intention to double the spindleage of the local plant by transferring 30,000 spindles from Lowell.

The plant of the Appleton Company at Lowell is equipped with 320 cards, 8,619 looms and 116,000 spindles. Some time ago the management became convinced that the possibilities of manufacturing colored goods in the South should be carefully investigated. On Dec. 26, 1922, the board of directors adopted a resolution setting aside $2,000,000 for the acquisition of a Southern mill and appointed a special committee to perfect and carry out the plans for this mill.

Leading experts were employed by the committee and their decisions were carefully checked by personal investigation. The committee decided not to build, on account of the excessive cost, but to buy a mill if possible. After extensive search, a suitable mill was found in the Brogon Mill at Anderson, S. C. The lowest estimate for building a satisfactory mill of 30,000 spindles, with dye plant and bleachery, with a village adequate for a day and night run, was $2,000,000. To build a similar mill of 60,000 spindles would have cost $3,400,000. Brogon Mill consists of buildings and machinery in excellent condition. The buildings are large enough to hold 60,000 spindles. The purchase was $1,90,000; the mill can be increased to a 60,000 spindle mill at an aditional cost of approximately $700,000, representing a saving of $1,600,000 over the best estimates for a 60,000 spindle mill.

To Remove Spindles.

The only building necessary to equip the plant for 60,000 spindles, day run, will be a new two-story building to contain dye house, bleachery and store houses. It is planned to obtain the 30,000 additional spindles by moving them from Lowell, as the spindles can be employed more profitably and for more hours per week in Anderson than in Lowell. This will give 86,000 spindles in Lowell and 60,000 in Anderson, or a total equipment of 146,000 spindles, being an increase of 30,000 spindles over the former capacity of the Appleton Company. Including the value of spindles moved from Lowell to Anderson, and all costs for moving and additional buildings, the Southern mill will stand at approximately $31 per spindle, which will compare favorably with mills built before the war. In other words, although it is not possible to build a mill today without excessive cost, the Appleton Company will have by purchase a modern plant at a pre-war cost for a colored mill, equipped with napping rooms, dye house and bleachery.

Cotton Spinning in Slight Drop

Cotton spinning industry showed a slight drop in the aggrgate number of active spindle-hours in November as compared with October, but they were considerably higher than a year ago, the census bureau reported. Active spindle-hours for November number 7,833,792,613 or an average of 207 hours per spindle in place, compared with 7,961,670,519 or an average of 210 in October this year and 7,123,959,034 or an average of 188 in November last year.

Spinning spindles in place November 30, numbered 35,919,358, of which 32,892,324 were operated at some time during the month, compared with 37,905,330 and 32,425,206 in October this year and 37,845,140 and 31,789,876 in November last year.

The average number of spindles operated during November was 46,417,612, or 96.0 per cent capacity on a single shift basis compared with 33,898,925 or at 89.4 per cent capacity during November last year.

Cotton Ginning Report

Washington, D. C.—Cotton of this year's crop ginned prior to December 13 totaled 14,826,452 running bales, counting round as half bales and excluding linters, compared with 12,792,294 bales ginned to that date last year, the census bureau announced.

Ginnings by States follow:

Alabama, 1,336,891; Arizona, 79,954; Arkansas, 1,347,969; California, 81,430; Florida, 39,852; Georgia, 1,180,926; Louisiana, 876,558; Mississippi, 1,708,298; Missouri, 226,247; New Mexico. 57,598; North Carolina, 1,085,534; Oklahoma, 1,516,925; South Carolina, 904,861; Tennessee, 451,611; Texas, 3,870,656; Virginia, 48345; all other States, 16,747.

Round bales included and counted as half bales, numbered 306,557 compared with 293,918 last year and 232,643 in 1923.

This year's cotton production, as estimated by the department of agriculture on the basis of facts available as of December 1, is 15,603,000, equivalent, 500-pound bales consisting of 478.1 pounds of lint and 21.9 pounds of bagging and ties. Last year's crop totaled 13,627,936 bales. Last year to December 13 the percentage of the total crop ginned was 93.8 per cent, in 1923 it was 93.9 per cent, in 1922 it was 97.5 per cent and in 1921 it was 97.7 per cent.

Increased Demand For Mill Stocks

The past six months have shown a remarkable change in activity of Southern Textile Stocks. During the early months of the year there was a lot of distress stock hanging over an inactive market but with the increased earnings of the mills in general, interest was stimulated and demand improved rapidly. The average of the 25 active Southern Textile Mills just released by R. S. Dickson & Co., stands at $119.20. This shows an increase of $5.92 since July 15th, the average on that date standing at $113.28.

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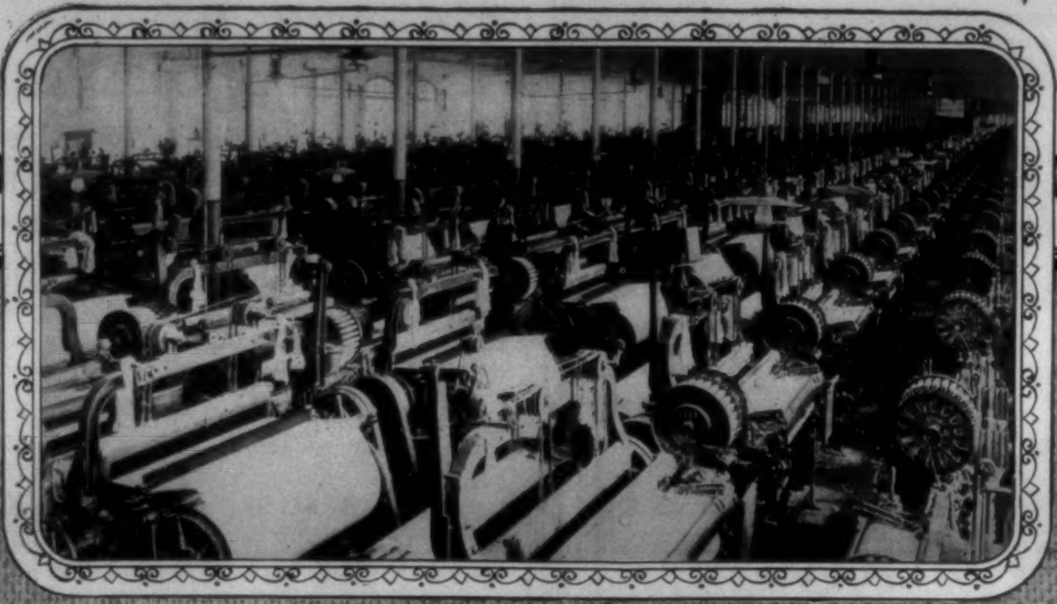

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Cotton Mill Processes and Calculations

By D. A. Tompkins.

Copy Revised for Third Edition.

(Continued From Last Week)

The length of traverse varies for different kinds of yarn, being less for fine yarns than for coarse yarns; 5½ inches is about the average, 7 inches being the maximum and 4½ inches the minimum.

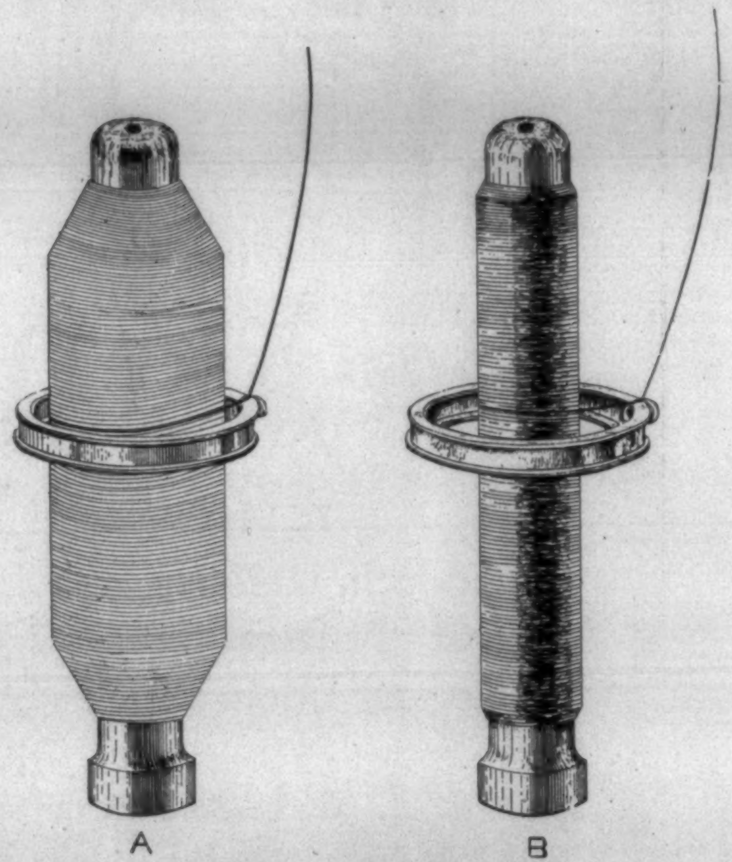

Fig. 39. Pull of Traveler.

Inequalities.

178. There is in the nature of the ring frame a small variation in twist, due to the traverse, whether long or short. It is slightly more in a 7 inch traverse than 6 inch, but it does not amount to more than one tenth of a turn per inch. In practice, the twist per inch is found by dividing the number of revolutions of spindles per minute by the number of inches per minute of yarn twisted. In the case of roving frames, where the flyer neither approaches nor recedes from front roll the amount of stock twisted is the exact amount delivered by front roll. But in spinning frame, where the ring with its traveler alternately approaches and recedes, this amount varies. Suppose front roll delivers 420 inches per minute, and spindle turns 8,400. If the ring rail were still, the twist would be 8400÷420=20. If the rail traverses downward 7 inches in one minute, it is receding from the point of delivery and thus produces the effect of diminishing by that much the amount of yarn passed through the traveler. Hence the yarn at the bottom of the traverse would be only 413 inches, and the twist per inch would be 8400÷413=20.3. But if the rail traverses upward 7 inches in one minute, it is approaching the point of delivery, and thus produces the effect of increasing by that much the amount of yarn passed through the traveler. Hence

the yarn twisted at the top of the traverse would equal to 42' inches, and the twist per inch would be 840÷427=19.7. This makes a total variation in twist between bottom and top of traverse 6. turns per inch. In the case of yarn having 20 turns per inch, this would amount to about 3 per cent. In the case of filling wind, where traverse is about 1½ inches, this variation would seem to be very much less. But as a matter of fact, the filling traverse is much quicker than warp traverse, so that it traverses about as many inches per minute in one case as in the other, thus producing about the same variation in twist per inch. But as filling twist is naturally less per inch than warp, the same variation per inch would be a greater variation in per cent.

Discussed as an abstract theory, the above calculation is not absolutely correct, because it is based on the assumption that twist is governed by the revolutions per minute of spindle, whereas it is in point of fact, governed by the revolutions of travelers as shown below. The relative difference in twist between top and bottom of traverse, however, in any case, be about the same as in the above calculation.

There is a variation in stretch between full bobbin and empty bobbin, due to the fact that the traveler pulls harder when bobbin is empty, and hence stretches yarn more than when bobbin is full and traveler pulls easier.

There is also a variation in twist between empty and full bobbin.

The amount of twist put into yarn is generally considered to be the ratio between yarn delivered by front roll and the speed of spindle. This is near enough the truth to use as an easy basis for calculation. But as a matter of fact, the twist is produced by the revolution of traveler, and not the spindle. As the traveler revolves somewhat slower than spindle, the actual twist is a little less than the calculated, and varies within small limits, from empty to full bobbin. Suppose empty bobbin is 2 inches in circumference, and front roll delivers 400 inches per minute, and spindle runs 8000 revolutions. If twist were produced by spindle, the twist would be 8000÷400=20 per inch. But traveler must lag behind spindle and bobbin (400÷2=)200 revolutions, and will therefore run but 7800. Hence the real twist will be 7800÷400=19.5, which is .5 turns per inch less than calculated, and is 2½ per cent. Suppose when bobbin is full, it measures 5 inches in circumference, traveler must sag (405÷5=) 80 revolutions, and will run but 7920. Hence the twist will be 7290÷400=19.8, which is .2 turns per inch less than calculated, and is 1 per cent. Hence in this case, the difference in twist between bobbin at beginning of set and at end of set is .3 turns per inch, which is 1½ per cent.

179. Another cause of variation in stretch of yarn, is the varying length between thread guide and ring rail. The length is greater when ring rail is at bottom. If the weight of traveler be selected to suit the conditions at bottom of traverse, that is, to control the ballooning, the pull of traveler will exert a a stretch on a longer portion of yarn then when rail is at top, and hence will produce a smaller amount of stretch per inch. When at top the stretch per inch will be greater. It is possible to put on a traveler that will run properly at bottom of traverse, but break down yarn at top. On the other hand, if traveler be selected light enough for the top, the ballooning will be excessive at the bottom, and might break down yarn by thrashing against separator; or in the absence of these, by entangling with adjacent bobbin. The traveler is selected to compromise these conditions, so that the machine may run; but the irregularities of stretch and tightness of bobbin wind still remain. It will be noted that while inequality of stretch

(Continued on Page 27)

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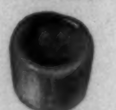
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If There Were No Christmas

If there were no Christmas we would miss the holiday spirit and the relaxation that comes just at the end of our year of labor.

We would miss the joy of giving and the lesser joy of receiving. We would miss the Christmas cards that tell us that our friends, many of whom we seldom see, still remember us and hold us in their affections.

We would miss the joy of children in their anticipation of the coming of Santa Claus and their extreme happiness on early Christmas morning. Some would miss the joy of finding children who because of poverty, would have no Santa Claus and of making the day a happy one for them.

If there were no Christmas we would miss much happiness and good cheer and friends would not be quite as good friends if it were not for the felicitations of the season.

We are glad that there is a Christmas and we extend to our readers and to our friends throughout the textile industry our best wishes for a happy season.

Vicious Propaganda

In the November issue of "Home and Foreign Fields," published at Nashville, Tenn., by the Sunday School Board of the Southern Baptist Convention, appears one of the most vicious pieces of propaganda against the cotton mills of the South that we have ever seen.

It is a synopsis of a short play entitled "Children of the Cotton Mill," which is so worded and arranged as to be easily put on by the children of any Sunday school.

We have not space to give the entire play but the following is one of the scenes:

(Enter at left several children poorly dressed, holding out bound hands. Liberty faces left. Children look at her.)

Liberty: Who are you, my children, and why do you come before me thus bound?

First Boy: We come from the cotton mills. Our hands are bound because we must work all day when the sun is bright and we should be playing. We work all day when we should have a chance to go to school. Our bodies are bound by disease; our minds are bound by ignorance; our souls are bound by neglect.

Liberty: These are serious charges you are making. (To first girl.) What have you to say?

First Girl: My father brought me from across the sea. He can't speak English, so he can't earn much money. There are five of us to feed and I am the oldest. I work in the mill, tying broken threads from six in the morning until six at night. I earn two dollars a week, but I get so tired. Every time I go past the schoolhouse it seems as if it calls to me. I long to learn to read.

Second Boy: I work in the mill every day and half of the day on Saturday. I change the full bobbins for empty ones. Sometimes I get so that I can't see much of anything. My sister used to work in the mill, too, but it was so damp there that she caught cold; then she got consumption, and now the doctor says she is going to die.

Second Girl: Did you speak to me? I can't hear very well. There is so much noise in the mill where I work. The other day a boy got his arm cut off in the machine. One day some people came to visit our mill. The foreman swore when he heard them and hid me in the closet; and I wonder why he did it.

Liberty: This testimony seems to convict the cotton mill of cruelty to the children of America. Is there defense?

(Enter at right Creed (boy draped in yellow), also Machine (boy draped in black) and Poverty (girl dressed in ragged clothes.) Children shrink (behind Liberty.)

Then the play goes on with Greed and Machine as portraying the cotton mill managers.

At the start of the play it states that the children in same are 10 to 12 years of age.

While no cotton mill in the United States can now employ a child under 14 years of age, the play deliberately seeks to create the impression that children of 10 to 12 are employed.

It seeks to create the impression that children get $2 per week, that the mills are damp and that the children often get their arms cut off.

We can imagine the effect of this play upon the congregation of a church in a section that knows nothing of cotton mills.

The author of the play is given as Mrs. Moffit Rhodes, but we have an idea that its real author is either the National Child Labor Committee or the Children's Bureau of the United States Department of Labor.

It is a vicious piece of propaganda deliberately written and intended to cause people to believe that very young children work in cotton mills under dangerous and unhealthy conditions.

The responsibility of its publication lies upon the Southern Baptist Sunday School Board and we sincerely hope that the Baptists in the cotton mills of the South will strenuously protest against an organ of their church being used to so falsely represent the conditions in our mills.

G. S. Dobbins is the editor of Home and Foreign Fields and his address is 161 Eighth Ave., North, Nashville, Tenn.

The Automatic Loom

"Mr. Speak, secretary of the Bolton Weavers' Union, directed his remarks to the introduction of automatic machinery and new fabrics in cloth manufacture. The automatic loom, he said, as at present applied, was not the success that had been anticipated."

The above extract from a recent meeting of the textile unions at Manchester, England, is typical of the attitude of labor unions in England towards automatic machinery.

It is rather amusing to the mill operatives of the South who have been running automatic looms for a generation to hear that they are not a success.

Fall River, Mass., decided about twenty-five years ago that automatic looms were not a success and that decisions resulted in eventually putting Fall River mills where their future is very questionable.

The egotism of the English is proverbial and they think that there is nobody in the world except themselves, who knows much about cotton manufacturing.

New England convinced itself that the South could never manufacture anything but coarse yarns and coarse goods and to some extent still sticks to that belief.

The South has been willing to learn from every section of the world and the mill managers have had the co-operation of the mill operatives in installing and adapting every automatic machine and every improved textile device that has come upon the market.

The textile South has sought knowledge and the day is rapidly coming when it will lead the world in textiles.

The Victim Of A System

Last week the president and treasurer of two coarse yarn mills shot himself. One of his mills was in the hands of a receiver and the stockholders of the other had requested his resignation.

He was a fine man and one of our best friends and we are deeply grieved that he did not find himself able to face adversity.

The system of selling yarns to speculators, so prevalent throughout the industry, had been too much for his mills and his stockholders awoke as we have predicted that the stockholders of other mills will awake, to the fact that the selling of the output was not being handled upon a business basis.

He was the victim of a system of selling coarse yarns that has gotten its tenacle around the coarse yarn mills of the South and is slowly but surely squeezing out their life.

He realized the situation and often spoke to us about it, in fact, two of his recent letters are now on our desk, but instead of installing looms and thereby shaking off the system, he kept hoping for a better day.

The general policy of selling to speculators and of beginning night operations as soon as there is a half cent margin, has made the future of the coarse yarn mills gloomy and when the stockholders awake, as they will, there will be other resignations requested.

Our friend was the victim of an unfortunate system and when after five years of terrible pressure and continued disappointments he realized that he must give up the fight, he yielded to a moment of weakness and took his own life.

The Private Cotton Estimates.

Come, meet the cotton expert—
A prophet rather quaint—
He studies statistics minutely
And sees crops as they ain't.
—Contributor.

One Thousand Years Ago

We are inclined to marvel at the wonders of modern science and to believe that our ancestors had little knowledge.

Ancient books and manuscripts that have just come to light in India seem to indicate that men of one thousand years ago knew much.

The recently discovered documents consist of manuscripts of palmyra leaves, dealing with religion, philosophy, arts, science, history, medicine, astrology, palmistry and many other subjects. It is believed to have had its origin long before the Bijapur Kingdom in India.

Wireless Telegraphy—It is said that communications can be carried from one place to another thousands of miles away by means of two stone plates, specially constructed.

Cotton growing—Processes are described by means of which it is possible to grow cotton of an color desired.

Geology—Operations are explained by means of which it is possible to know what things are hidden below the surface of the earth, so that the location underground of such things as precious metals, hidden treasure, buried cities, etc., can be easily ascertained.

Personal News

J. K. Giles is now secretary of the Elizabeth James Mills, Marion, N. C.

Walter F. Whatley has become overseer of carding at the Mobile Cotton Mills, Mobile, Ala.

T. G. Bullard has resigned as overseer of carding at the Mobile Cotton Mills, Mobile, Ala.

Oscar Helms has become overseer of night spinning at the Mobile Cotton Mills, Mobile, Ala.

O. L. Thompson has resigned as overseer night spinning at the Mobile Cotton Mills, Mobile, Ala.

C. C. Stokes has been appointed secretary of the Cheraw Cotton Mills, Cheraw, S. C.

L. W. Jones is now treasurer of the Southern Franklin Process Company, Greenville, S. C.

F. J. Wright has resigned as superintendent of the Marlboro Mills No. 3 and 6, McColl, S. C.

H. G. Utley has been appointed secretary of the Buffalo Mills, Stubbs, N. C.

B. S. Gaither has succeeded R. T. Claywell as president of the Waldensian Weavers, Inc., Valdese, N. C.

E. H. Spruill has been appointed secretary of the Melrose Knitting Mills, Raleigh, N. C.

J. W. Croach is now superintendent of the Conhankus Manufacturing Company, Paducah, Ky.

H. C. Cale has been elected secretary of the May Hosiery Mills, Burlington, N. C.

W. B. Rogers has become superintendent of the Durham Hosiery Mills No. 1, Durham, N. C.

J. C. Seagle has succeed T. H. Broyhill as president of the Caldwell Cotton Mills, Hudson, N. C.

W. D. Carlton is now manager of the Anniston, Knitting Mills, Anniston, Ala.

E. W. Bullard has resigned as treasurer of the Anniston Yarn Mills, Anniston, Ala.

H. B. Clements has succeeded W. H. Barnes as treasurer of the Southern Mills Corp., Oxford, Ala.

G. N. Murray has been appointed secretary of the Lowell Bleachery South, Griffin, Ga.

Frank L. Asbury, Jr., has become superintendent of the Hillside Cotton Mills, LaGrange, Ga.

J. W. Alexander is acting superintendent of the Western Reserve Cotton Mills, Quitman, Ga.

Marvin H. Carter has resigned as overseer spinning at the Laurel Mills, Laurel, Miss., and accepted a similar position with the new Pepperell Manufacturing Co., Opelika, Ala.

Fowler Jackson is now superintendent of the National Yarn and Processing Company, Rossville, Ga.

T. W. Webster, of High Shoals, N. C., has become overseer of carding and spinning at the Red Springs Cotton Mills, Red Springs, N. C.

H. B. Dowell is now manager of the Sand Springs plant of the C. R. Miller Manufacturing Company, Sand Springs, Okla.

M. B. Leath has been appointed assistant treasurer of the Pee Dee Manufacturing Company, Rockingham, N. C.

B. M. Gillon has succeeded E. R. Neave as secretary and treasurer of the Vance Cotton Mills, Salisbury, N. C.

B. H. Blanton has been appointed secretary and manager of the Sek-Reliance Corp., formerly the Reliance Dye Works, Covington, Ky.

A. B. McCormick is now superintendent of the Cascade Mills, Mooresville, N. C., of which W. H. Gibson, Jr., is general superintendent and manager.

George Grice has succeeded M. C. Kirksey as superintendent of the Lola Manufacturing Company, and the Lola Gingham Mills, Stanley, N. C.

Clarence Driver has resigned his position with the Humboldt Cotton Mills, Humboldt, Tenn., and is now with the J. W. Sanders Cotton Mills, Starkville, Miss.

A. G. Pittman has resigned as overseer of carding and combing at the Peck Manufacturing Company, Warrenton, N. C., to become overseer carding at the Hart Mill No. 2, Tarboro, N. C.

G. W. D'Ary, president of the Rhode Island Humidifier and Ventilating Company, has been spending some time in Charlotte with Harry H. Hayes, Southern representative of the company. Mr. D'Ary and Mr. Hayes visited a number of mills in this section.

J. W. Jenkins, superintendent of the Hannah-Pickett Mills, Rockingham, N. C., was injured in an automobile accident near Charlotte, Sunday night. He suffered a broken arm and bruises about the head. He is being treated at the Charlotte Sanitorium. He is improving rapidly. Mr. Jenkins was on his way to Charlotte when the right front wheel of his car ran off, the car going down an embankment.

Gem Cotton Mills

Gibsonville, N. C.

Eugene Holt	Manager
T. L. Saunders	Superintendent
J. M. Harden	Carder
E. L. MsSwain	Spinner
T. J. Saunders	Shipping Clerk

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AMALIE RAYON-OIL is particularly adaptable for finishing silk piece goods as well as mixed fabrics containing cotton and rayon. It will fulfill your special requirements more efficiently and enhance the appearance of your finished goods.

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MILL NEWS ITEMS OF INTEREST

Roseboro, N. C.—It is reported that a new cotton mill is to be built here. Subscriptions to purchase a site are being made by local business men and more definite information is expected within a short while.

Columbus, Ga.—It is reported here that the Perkins Hosiery Mills will spend approximately $100,000 for replacing present equipment and making other improvements.

Camden, S. C.—The Hermitage Cotton Mills have completed electrification of their mill, the latest equipment including 500 horse-power in Allis-Chalmers four five frame drives.

Spindale, N. C.—The Stonecutter Mills have placed order with G. G. Slaughter, of Charlotte for winding equipment for handling rayon, the the equipment to come from the Sip Machine Company, Paterson, N. J.

Drayton, S. C.—The Drayton Mills have purchased a silk slasher, manufactured by Charles B. Johnson, Paterson, N. J., the order being handled through G. G. Slaughter, Southern agent.

Charlotte, N. C.—The equipment of the Veritas Silk Mills, which is to begin operations here within the next several months will include silk warpers made by the Sipp Machine Company, Paterson, N. J.

Kinston, N. C.—The Kinston Knitting Company, which was recently organized to take over the Orion Knitting Mills, with plants here and at Beaufort, N. C., have elected officers as follows: C. F. Harvey, president; C. Otettinger, secretary and treasurer; R. J. Moers, manager and superintendent.

Fort Mill, S. C.—The Fort Mill Manufacturing Company, reported last week as replacing 200 looms with new equipment, have placed orders with the Draper Corporation for about 400 wide looms which will replace approximately 800 narrow gingham looms. The new looms are to be equipped with the Allis-Chalmers individual loom motors.

Birmingham, Ala.—Operations at the new Strowd-Holcombe Cotton Mills, recently organized here as noted, will be started about March 1. The plant will have an equipment of 8,000 spindles and 240 looms, makin gsheetings and flannels. It will be operated in connection with the Buck Creek Mills Siluria, Ala.

Officers of the company are W. F. Strowd, president; Mrs. T. C. Thompson, chairman of the board; H. H. Holcombe, vice-president and general manager; R. D. Johnston, secretary and treasurer.

Goldville, S. C.—A contract for the immediate construction of 50 additional homes for employes of the Joanna Mills, at Goldville, Laurens county, has been awarded to a local construction firm.

Upon completion of these homes, the Joanna Mills will be operated night and day, according to an announcement by the management.

Anderson, S. C.—The contract for the erection of 25 new houses in the Orr Cotton Mill village has been awarded to the Townsend Lumber Company of this city.

Construction of these houses will start at once and they will be ready for occupancy by February 1926. The total cost will be around $50,000. Of the 25 cottages, 17 of them will be four room, seven will be five rooms and one will contain six rooms. Each cottage will be well finished inside and out and equipped with water, lights and sewerage.

Kingsport, Tenn.—Construction is progressing on the first unit of 100 dwellings being erected here by the Borden Mills, Inc., for the use of employes in their new cotton mills. Ground was broken for the first house in October and it is expected that all will have been completed by March 1. Approximately 150 workmen are engaged on the dwellings. W. L. Holyoke of the Borden Mills is superintendent of construction.

Guthrie, Okla.—A cotton mill may be erected here, according to statements of a party of bankers and business men from this city who visited Dallas, Texas this week to inspect textile plants there. C. R. Miller, president of the C. R. Miller Manufacturing Company, of Dallas, had charge of the visting party. Among those from Muskogee were: A. J. Calhoun, W. F. Durnil, J. H. Shouse, T. E. Harbour, J. T. Griffin, E. W. Klos, D. N. Fink, H. H. Ogden, Ben Dougherty, J. C. Culberson, W. E. Rowsey, W. S. Wiley, W. D. Egolf, W. L. Linhard and John L. Brandt.

There is one mill here now, the Pioneer Mills.

Shannon, Ga.—Fifty carloads of machinery from the Passaic and Allwood plants of the Brighton Mills are being shipped to the new Southern Brighton Mills here, which have practically been completed and will be in operation about January 15.

The main office of Brighton Mills have been moved from the Passiac to the Allwood plant, where production of cord fabric for automobile tires is being continued. Lower taxes and lower labor and power costs caused Brighton officials to erect the plant at Shannon, which reresents an outlay of approximately 1,500,000. A total of 35,000 spindles and 48 cord looms will be installed at Shannon, and the capacity will be be approximately 91,000 pounds of cord fabric a week.

Officers of Brighton are Henry J. Haight, president; Timothy J. Keely, vice-president; Thomas M. Gardner,

Houston, Tex.—The newly organized Houston Hosiery Mills is now operating on full time, but according to L. A. Parsons, manager, none of its products will be placed on the market until a sufficient stock is on hand to take care of the orders that may come in.

The board of directors comprises W. R. Scott, president of the Southern Pacific Railway Lines, Herbert B. Finch, vice-president of the Union National Bank of Houston, and J. P. Houston.

It is reported in Houston that a yarn factory may be established here as an adjunct of the hosiery mill should the demand for the yarns and the hosiery prove large enough.

The only other hosiery mill now operating in the State is at Dallas. At present the Houston Hosiery Mill is confining its output to cotton socks, but after a time it expects to make the finer grades of hosiery.

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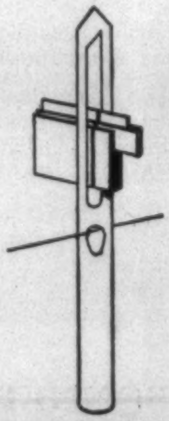

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Cotton Crop of Poor Quality

This year's crop contains more low grade cotton than any year since 1920, Secretary Jardine of the Department of Agriculture, declared in a letter to a special congressional sub-committee.

The latter was addressed to Senator Smith, Democrat, South Carolina, chairman of the special cotton committee consisting of a Senator and Representative of each cotton growing State selected to recommend cotton legislation at this session of Congress.

The committee held its first conference recently, but adjourned for the holidays without action beyond appointing a substitute committee to ascertain the amount of this year's cotton crop that is untenderable under futures contracts and is unspinnable.

The secretary's letter, replying to the sub-committee's request for the information, said:

"I regret that the Department of Agriculture is without definite information on these subjects. A definite statement that has come to us recently shows estimates of the untenderable cotton of this season's crop to range from 2,500,000 bales to 4,500,000 bales, with the average of several estimates about 3,500,000 bales. This includes cotton that is below the lowest tenderable grades and cotton that is less than ⅞ of an inch in length of staple. The department has estimated the 1925 cotton crop at 15,603,000 bales of 500 pounds of which the bureau of census reported that there were ginned to December 1, 1925, 13,857,686 running bales. This leaves about 1¾ million bales of cotton to be ginned before the final ginning report, on March 20, 1926. Press on March 20, 1926. Presumably, the cotton remaining yet to be ginned will be of the lower grades and much of it untenderable. It is a safe assumption that no crop inrecent years, saving possibly that of 1920, has contained so large a proportion of low grades in particular.

"With reference to the proportion of the crop which is 'unspinnable' cotton, it might be said that this term is often used inappropriately to mean cotton of low grade. Practically all cotton, even of the lowest grades, is spinnable and eventually used in the manufacture of coarse yarns and goods. The objections to the use of extremely low grade cotton are its comparatively large waste content, its inferior finishing properties, reduced mill consumption and dissatisfaction created among mill operatives due to the greater amount of dust and fly and the lower earnings of those employed on a piece work basis.

"Surveys of the kind your inquiry suggests have been undertaken from time to tim.e in the past, when specifically requested by Congress. A good deal of difficulty has been experienced in securing dependable data, due to lack of uniform classification and the consequent uncertainty as to the comparability of reports. This obstacle has been largely removed by the cotton futures act and the cotton standards have within the past two years become thoroughly established. The department regards the regular compilation and pulication of data of this kind as highly desirable."

New Viscose Plant

Announcement is made that work will be begun at once on the new manufacturing plant to be erected at Parkersburg, W. Va., for the Viscose Company, among the largest manufacturers in the world of rayon, textile. The contract has been awarded to John PettyJohn & Co., Lynchburg, Va., and the plant is to be erected in accordance with the drawings and specifications prepared by the Ballinger Company, architects and engineers, Philadelphia and New York. At the present time the new plant is expected to employ about 3,000.

The new plant at Parkersburg will occupy a tract of ground having an area of about 125 acres and located along the Little Kanawha river.

The new buildings include the main manufacturing group, which is principally of one story saw tooth type, together with auxiliary buildings, also power and boiler houses, reservoir and filtration plant and a large dining hall for the use of employees.

In general the buildings will have brick walls with brick on edge sills and stone coping. Roof construction will be of steel trusses using the improved "Super-Span" saw tooth designs with plank roof and asphalt to suit the various conditions of occupancy.

There will be installed a complete sprinkler system with 100,000 gallon steel water tank on a steel tower, also a brick chimney 20 ft. inside measurement by 300 ft. high.

Six freight elevators wil be installed, also complete systems of plumbing and drainage, steam heating and power piping, and electric light and power wiring, together with water purification system.

The new plant will be completed ready for occupancy before the end of 1926.

Belting Co. to Build in Charlotte.

Contracts for the erection of the $200,000 factory building of the Scandivinavia Belting Company on North Tryon Street extension, Charlotte, will be awarded December 28.

Bids on the project will be received until that date by the local office of Lockwood, Greene & Co..

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by using WASHBURN WOOD TOPS on their Spinning Frames in place of the old-fashioned intermediate top rolls.
Eliminate re-setting to staple and say "Good-bye" to Cockles.
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South Carolina Representative.

Southern Spinners' Bulletin

The weekly bulletin of the Southern Yarn Spinners Association says:

In spite of the gradual recession in price of cotton since December 8th, the yarn market has remained fairly stable. Spinners prices remain firm and at an advance over dealers' quotations.

Business is quiet with but little demand except for spots deliveries of hand-to-mouth purchases. The situation among the spinners is satisfactory as mills are well supplied with orders to last them until after the first of the year.

There has been more inquiry for carded knitting yarns for delivery shortly after the first of the year than for some time. Demand for weaving yarns, however, is quiet.

Mexico's Textile Trade Active.

Activity in the Mexican cotton industry was maintained at a silghtly higher level during the six months ended April 30, 1925, than during the corresponding periods of 1923 and 1924. During the period under discussion, 824,061 spindles and 30,506 looms were reported active in 1925; the mills consumed 83,970 bales of cotton; 42,671 operatives were employed; and the number of hours worked aggregated 225,733. Comparative figures for the corresponding period of 1924 were; 804,613 spindles and 29,746 looms active; cotton consumed, 57,588 bales; operatives employed, 36,507; total hours worked, 142,666. (Additional information on the Mexican industry may be obtained from the December 28th issue of Commerce Reports).

Mexican textile manufacturers have been in conference for some time trying to evolve some method of doing away with the excess production of the mills at certain months of the year necessitating the closing of many during slack periods. The present plan of the convention, and it is the general belief that it will be adopted, provides for the payment of a 50 per cent increase over single shift wage for all extra shifts. This plan, according to its advocates, would tend to stabilize production, prices, and wages. (Assistant Trade Commissioner Warren Ullrich, Mexico City).

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AUTOMATIC SHUTTLES
Our Automatic Shuttles are giving Perfect Satisfaction in Leading Mills throughout the country on all classes of work

Cotton Mill Processes and Calculations

(Continued from Page 21)

is governed by varying distance between thread guide and ring rail, inequality of twist is governed by varying distances between front roll and ring rail. This is for the reason that the guide eye terminates the top end of the balloon, while front roll terminates the top end of the balloon, while front roll terminates top end of twist. At one time, there was considerable money spent in making a spinning frame, in which spindle traversed up and down ,while ring rail stood still. Theoretically this would eliminate the inequalities of both stretch and twist, or so much of it as results from this cause. The mechanical difficulties in the way of perfecting this machine were never overcome. There is some experimenting now being done in making a movable thread guide, which will traverse up and down with ring rail, similar to the separator. This, if successful, will not only reduce inequality of stretch, but may diminish the total stretch by allowing a lighter traveler to be used; or if the same traveler is used it may reduce the necessity for separators.

Varying humidity in the mill atmosphere will also cause irregularities of yarn, no matter by what method it is spun.

Notwithstanding all the theoretical imperfections of ring spinning, it has taken a firm hold on the spinning industry, and has reduced the cost of spinning. The labor required is about 10 per cent. less than for mule spinning, and the space occupied is about half.

180. It has been stated that spindles in ring frames run clockwise. This is the usual custom; and traveler clearers and other things about the mill, are made to correspond. But there is no reason in the nature of the case why spindles should not run either way.

In some English mills, the ring frame spindles run right hand to make warp, and the filling—usually—mules run left hand. This is to make smoother cloth, and is a good idea where this quality in cloth is of consequence. There is no reason why ring filling should not be spun in this way. Fig. 40 shows on an enlarged scale how the warp and filling interlace, when both are spun right hand, and also when one of them (the filling for example) is spun left hand. In the latter method, the intermeshing is more perfect.

Calculations.

181. In the operation of a mill, the only calculations necessary on a spinning frames, are for draft, twist and production. These are made on the same principles as for roving machinery.

Figure 41 shows the gearing in spinning frame. Taking the gears as shown, and assuming a draft gear of 44, (and noting that front roll is 8 eighths diameter and back roll 7 eighths,) and considering the back roll the driver, the formula for draft would be:

$$\frac{8 \times 84 \times 128}{7 \times 44 \times 30}$$

This works out 9.31. The draft constant would be 9.31 x 44=409.6. An increase of one tooth in draft gear reduces draft about .21. A decrease of one tooth in draft gear increases draft about .21.

182. As previously shown, the twist is quotient obtained by dividing spindle speed by inches delivered. On the spinning frame, it is usually calculated by assumption, the spindle speed may be found by dividing the diameter of tin cylinder by effective diameter of spindle whorl. But on account of possible variation of diameter and tension of spindle, band, the best way is to actually turn the cylinder by hand, exactly

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We wish to obtain a complete list of the superintendents and overseers of every cotton mill in the South. Please fill in the enclosed blank and send it to us.

______________________1923

Name of Mill______________________

Town ______________________

__________Spinning Spindles __________________ Looms

______________ ______________ Superintendent

______________ ______________ Carder

______________ ______________ Spinner

______________ ______________ Weaver

______________ ______________ Cloth Room

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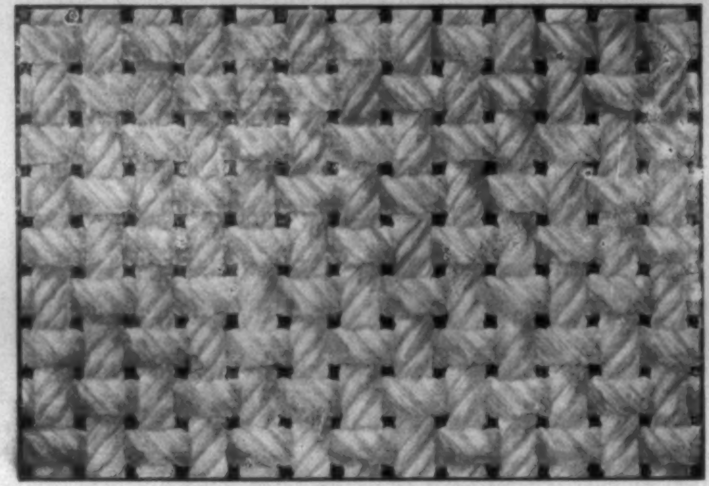
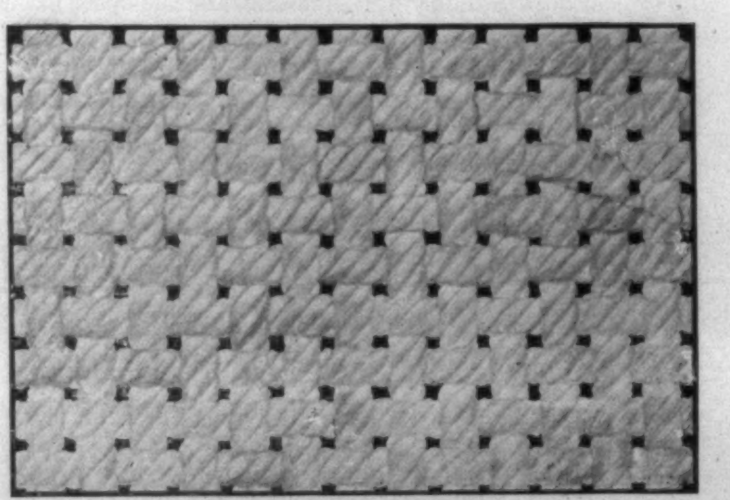
one turn, and count the turns of spindle. Suppose this to count 7.75. Suppose the twist gear to be 28. The inches delivered by front roll for one turn of cylinder will be

$$\frac{30 \times 28 \times 1 \times 3.1416}{90 \times 112}$$



Warp right hand twist
Filling right hand twist
HARSH CLOTH



Warp right hand twist
Filling left hand twist
SOFT CLOTH

Fig. 40. Right and Left Twists.

This works out .26. Dividing 7.75 by .26 gives as the twist 29.9. Written as a complete formula, the twist would be

$$\frac{90 \times 112 \times 7.75}{30 \times 28 \times 1 \times 3.1416}$$

This works out 29.9, as before. An increase of 1 tooth in this twist in yarn about 1 per inch.
Decrease of 1 tooth increase twist about 1 per inch.

A good way to verify calculation on twist, or to quickly find out the twist on any given frame, is to find out revolutions of spindle per minute by actual count; find out revolutions of front roll by actual count; multiply speed of front roll by circumference to get inches per minute; divide revolutions of spindle by inches of yarn. The result is twist per inch.

183. The speed of a spinning frame is generally designated by speed of front roll. When this is given—say 100—the speed to run driving pulley on a frame geared as Fig. 41,

would be obtained by considering the front roll as the driver, and writing the formula:

$$\frac{100 \times 112 \times 90}{28 \times 30}$$

This works out 1200. With a given front roll speed, the tin cylinder (and driving pulley) speed will vary with the twist gear, the larger the twist gear the slower the pulley speed necessary.

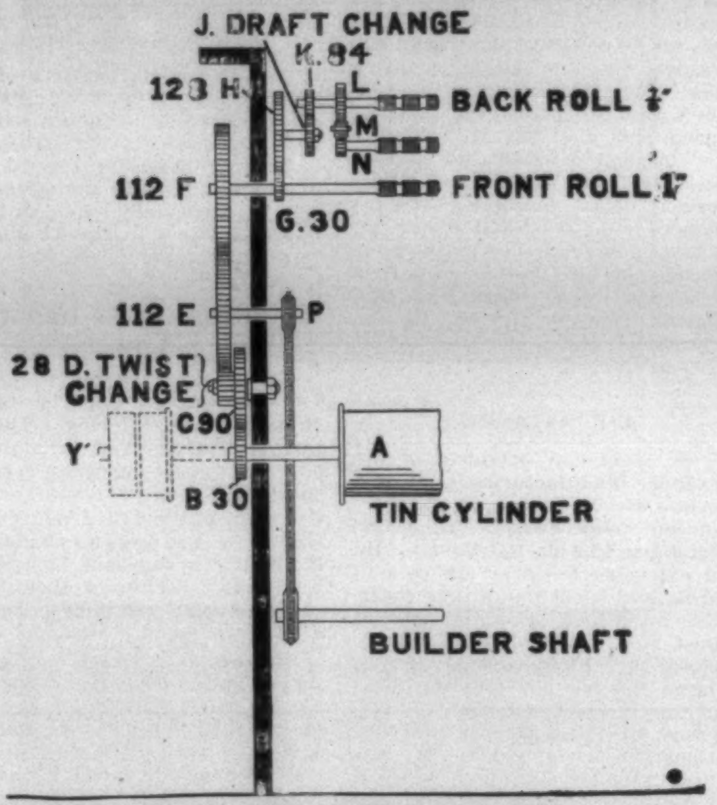


Fig. 41. Spinning Frame Gearing.

PRODUCTION.

184. Speed of front roll per minute multiplied by its circumference in inches will give theoretical production in inches. This multiplied by 60 and 10 will give the inches per day. This divided by 36 and 840 will give hanks per spindle per day. Written as a formula this would be:

$$\frac{100 \times 1 \times 3.1416 \times 60 \times 10}{36 \times 840}$$

This works out 6.3 hanks per spindle per day of 10 hours, if running all the time. An allowance of 10 per cent must be made for doffing and other stops. The actual result to be expected is therefore 5.67 hanks.

If spinning number 40, the pounds per spindle per day would be 5.67÷40=.14.

General Data.

185. Spinning frames are made 36 inches or 39 inches wide, as ordered. On account of allowing longer spindle bands the 39 inch frames are considered better; but on account of saving space, 36 inch frames have become practically universal in the South. They are usually made about 27 feet long and contain more or less spindles for that length according to the gauge. A common gauge for numbers 16 to 30 is 2¾ inches. The ordinary number of spindles for such frames is 208, being 104 on a side. There are 8 spindles between roll stands, and hence the number of spindles on a side should be a multiple of 8. Thus 104 spindles would require fluted rolls to be in 13 sections.

(Continued next Week)

Greetings of the Season

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Indications point to increased business in the Textile Industry. We are prepared to give you QUICK — THOROUGH — DEPENDABLE SERVICE.

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"We Manufacture, Overhaul and Repair Cotton Mill Machinery"

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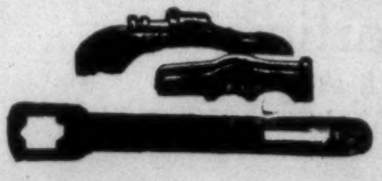

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WRITE FOR SAMPLES

Obituary

J. F. Taylor.

J. F. Taylor, widely known mill executive of Kinston, N. C., died in Kinston last week after a long period of ill health.

Mr. Taylor was president and treasurer of the Kinston Cotton Mills and until recently secretary and treasurer of the Orion Knitting Mills. He helped organize the Kinston Cotton Mills and was the first superintendent of the mill. He was later promoted until he became president. He was at one time president of the Southern Soft Yarn Spinners Association and was one of the best known mill men in the State.

Besides his mill interests, Mr. Taylor was active in social civic and religious affairs in Kinston. He was 61 years old and is survived by his wife and one son.

J. F. Alexander.

J. F. Alexander, president of the Alexander Manufacturing Company, Forest City, N. C., banker, lumberman and hotel owner, died at St. Petersburg, Florida last Friday. He had extensive business interests in Florida and spent much time there.

Mr. Alexander built the mill at Forest City and operated it very successfully. He was connected with a large number of Hotel business concrens in and around Forest City. He was president of the Alexander National Bank, St. Petersburg, and owned a number of hotels in Florida. Mr. Alexander was 61 years of age and is survived by his widow and three small children.

Mrs. R. S. Rheinhardt.

Mrs. R. H. Rheinhardt, widow of the late Robert S. Rheinhardt, prominent cotton manufacturer of Lincoln ton, N. C., died at her home in Lincolnton on Sunday. She had been in ill health for almost a year, her condition becoming worse after the death of her husband in September.

New Publications

Dyers' Formulae.

The National Aniline and Chemical Company, has just issued for 1926 its Dyers' Formulae and Spring Season Shade Card. It lists a large number of dyes for cotton, wool and silk and gives dyeing formulae and directions for handling. The recipes have been prepared by the Dye Application Laboratories of the National Aniline and Chemical Company, for matching shades shown in the 1926 spring shade color card. The book will be found exceedingly useful by practical dyers and may be had upon application to the company.

An Idea.

Under the title "An Idea," the Franklin Process Company, of Providence, has just published a very interesting and attractive booklet, reviewing the progress and development of the Franklin Process Raw Stock Dyeing Machines. The book shows that since the installation of the first machines the sales have grown steadily, and that they are now enjoying an excellent distributio among the mills.

The advantages of the Franklin system of raw stock dyeing are clearly set forth in the book which will be found worthwhile by any mill man interested in the raw stock dyeing problem.

Gray-Separk Diary.

The Gray-Separk group of mills of Gastonia, N. C., have issued and are distributing to their friends the 1926 edition of the diary which they have distributed for several years. The 1926 diary, like the former edition is handsomely bound in leather and is being received with much interest and appreciation.

Cotton Goods Imports Lower

Cotton goods imports by the United States during November totaled 5,747,808 square yards, according to the monthly report of the Department of Commerce. The Government's detailed figures show that there has been no change from the restricted business. Last month's total was a decline of about 700,000 square yards from the October total of 6,492,239 square yards.

Broadcloths, still constituting the largest single class of imports in the list, represent 3,487,949 square yards of the November total, compared with 3,754,315 square yards in October. During November of last year there were 9,488,522 square yards of broadcloths imported.

The November imports of sateens woven with not more than seven harnesses totaled 443,684 square yards, showing a slight increase over October's total of 188,224 square yards. Of sateens woven with eight or more harnesses, there were 108,013 square yards, showing a decline from the 250,409 square yards imported during October.

Imports of "lawns, organdies, nainsooks, cambrics and similar fine goods of average yarn number above 40's totaled 770,275 square yards in November, compared with 1,423,682 square yards in October.

November imports of voiles were 683,575 square yards, compared with 600,333 square yards in October.

Imports of crepes, plain and fancy, totaled 95,777 square yards in November, compared with 105,359 square yards in October.

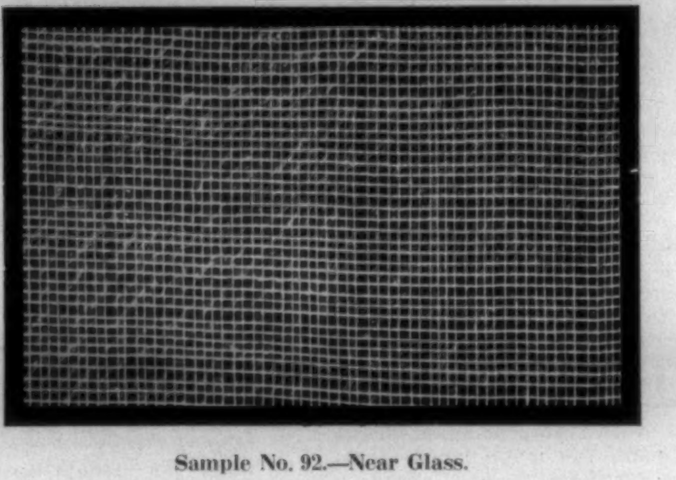
There were 10,434 square yards of ratines imported in November, comared with 1,721 square yards in October; 8,415 square yards of dotted Swisses, compared with 13,567 in October. There were 85,398 square yards of all jacquard woven cloths imported in November, compared with 40,796 square yards in October. There were 54,288 square yards of ginghams imported, compared with 103,733 in October.

Chilean Market Slow.

The closing of the Banco Espansol slowed down purchasing in general lines of merchandise, especially textils. Commercial Attache Ralph H. Ackerman reports.

Imported Cotton Cloths

From Survey of United States Tariff Commission.

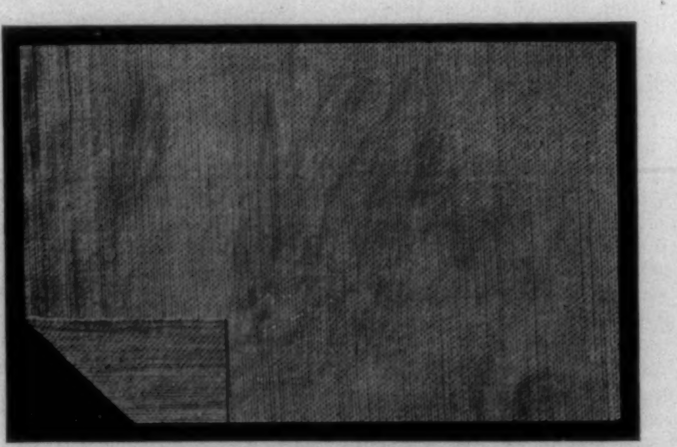


Sample No. 92.—Near Glass.

Plain woven. Finished width, 54 inches.
19 ends and 18 picks per square inch, finished.
Warp yarn, 72s. Filling yarn, 60s.
Weight, 15.26 linear yards (22.89 square yards) per pound, finished.
Bleached and coated.

Sample No. 93.—Book Cloth.

Plain woven. Finished width, 40 inches.
66 ends and 56 picks per square inch, finished.
Warp yarn, 34s. Filling yarn, 35s.
Weight, 3.79 linear yards (4.21 square yards) per pound, finished.



Sample No. 94.—Window Holland

Plain woven. Finished width, 48 inches.
67 ends and 55 picks per square inch, finished.
Warp yarn, 22s. Filling yarn, 24s.
Weight, 2.15 linear yards (2.87 square yards) per pound, finished.

Barber Spinning & Twister Tapes

It pays to specify BARBER tape when renewing your tape supply. QUALITY, the outstanding feature, is emphasized. But you get this QUALITY combined with fair prices and years of "knowing how" all put together. Standards from which we do not shift assure you of satisfactory service year in and year out. Pioneers as spinning and twister tape makers we still maintain our enviable reputation as "Spinning Tape Specialists." Made in the South for Southern Spinners.

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CHARLOTTE, N. C.

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SPINNING & TWISTING TAPES

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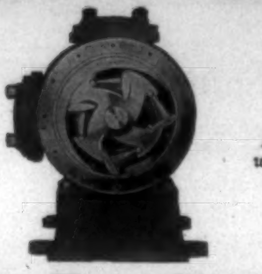
Greenville, S. C. Atlanta, Ga.

BLACKMER
ROTARY PUMPS



Blackmer Rotary Pump with face plate removed showing interior construction.

Slasher and Dye House Pumps
Built for Their Job

Blackmer Rotary Pumps are satisfactorily serving the textile industry as slasher and dye house pumps, because they are built for their job.

They may range in capacity from 5 to 500 GPM. and may be either solid iron or solid bronze with iron or bronze replaceable lining. All pumps handling sizing compounds may be equipped with "monel metal" shafting.

Every Blackmer Rotary Pump incorporates in its design the Blackmer Principle of automatic take-up-for-wear. This principle of pumping adjustment assures you a long life of pumping efficiency at a minimum operating cost.

The BLACKMER Principle

Four bronze buckets, set in recesses in a revolving rotor, ride lightly against the outer cylinder wall, held there by centrifugal force. As wear occurs, this same force automatically takes it up.

Let our engineers help you
solve your pumping problems

BLACKMER ROTARY PUMP Co.
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The more the Textile Industry learns about Sizol Service the better it appreciates its value in successful weaving.

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THOMAS W-S-D Grates have real merit and are used by representative concerns in all sections. Let us submit proposal with full data for your plant.

THOMAS GRATE BAR CO., Birmingham, Ala.

Power for Textile Mills

(Continued from Page 8)

amount which can be invested in water power is less than could be for a plain mill.

As the variations in costs and uses are great, each case requires careful study, and there must be kept in mind, so far as can be foreseen, possible future changes in fuel prices and advance in the art.

Many mills now have the opportunity of purchasing electric current from some central power station or power company which is producing power either by stream or water power, or both.

FOUR—Power for textile Mills—

There are many points of advantage to the mill if such power can be purchased at a reasonable price, which will not be discussed here.

Assuming that the mill will consider the purchase of power on a basis of cost of production by its own plant, how much can it afford to pay for the same

Plate 5 shows approximate fair prices for purchased power for plain and colored goods textile mills.

1. A plain cotton mill, having use for exhaust steam for heating and slashing only, could afford to pay for guaranteed power about as follows:

Plate 5

Capacity of plant	Running 48 hrs. per wk. Coal at $7.00 per ton Cost per		Running 54 hrs. per wk. Coal at $4.00 per ton Cost per	
KW.	KW. per yr.	Kw. Hr.	KW. per yr.	Kw. hr.
1000 KW.	$55.00	2.56c	$47.50	1.95c
5000 KW.	39.00	1.81c	33.50	1.37c
2. A colored mill, using about three-quarters of the waste heat from the power plant in manufacturing, could pay:				
1000 KW.	$32.00	1.47c	$28.50	1.17c
5000 KW.	21.00	0.96c	19.00	0.78c

3. With an established mill with a good power plant all built, the mill has its investment in steam plant to charge off, and it could afford to pay an amount somewhat less than if it were a new mill, and could save the investment in steam plant.

The amount to charge off will depend on how many years the existing plant would naturally run in an efficient manner, and it can be spread over this length of time, or done in a shorter period.

If the steam plant is not efficient, no such deduction should be made.

4. For amounts of power less than 1,000 kilowatts, the price which could be paid would increase.

5. All of the figures presented have been made for textile mills, the load of which is fairly uniform, and the service less severe than for almost any other business. Some other kinds of business can pay considerably more for power than textile mills.

General Conclusions.

Having made a survey of the possibilities of the production of power water and steam, or the purchase of electric current, a conclusion can be reached as to what plan should be followed. Each problem requires its own solution.

At the present stage of the art, the following general statements can be made fairly safely.

ing water power developments of some merit, usually in connection with steam power.

a. If the water power plant is old and inefficient, remodel it, and thus increase its output.

b. If the steam power plant is old and inefficient, and electric current can be purchased at a reasonable rate, purchase current sufficient to make up for lack of power from the water power plant.

2. Plain mills run by steam power alone.

If the steam plant is old and inefficient, and electric current can be purchased at a reasonable rate, it should be done.

3. Colored mills.

a. If the water power plant is old and inefficient, a study should be made to ascertain if it will pay to remodel, it and to make still further use of the water power. In some cases, where the mill has grown, it has been necessary to conserve all the water for manufacturing purposes.

There is usually so much use for low-pressure steam and warm water for process work, that all or nearly all of the heat rejected from the steam engine or turbine can be used, thus reducing the net cost of power to an amount probably so low that it will not pay to purchase electric current.

For New Mills.

a. Plain mills of moderate size can probably purchase current cheaper than it can be generated by an isolated plant at the mills.

b. Colored mills of any size can usually py produce power and steam and warm water for manufacturing processes cheaper than they can purchase electric current and produce the required amount of steam and warm water.

Russia Places Textile Orders in Esthonia.

Representatives of the Esthonian textile industry who have just returned from Russia report that their negotiations in Moscow resulted in the Soviets placing orders with the Esthonian mills for goods to the amount of 500,000,000 Esthonian marks (mark—approximately $.0026) according to a report to the Department of Commerce by Consul Joseph G. Greeninger, Tallinn. The largest orders were for cotton yarn. The cotton cloth is to be delivered wihtin four months and the yarn within seven or nine months. The Bank of Esthonia is guaranteeing and financing these orders against stocks on hand and arriving for storage in the Soviet warehouses in Tallinn.

Bleaching of Sized Fabrics

(Continued from Page 9)

condition must be mentioned and that is all the solutions and the apparatus employed be absolutely free of all chlorine content. This is a difficult condition to carry out, but the anayltical results would not be worth much if it was not fulfilled.

In order to determine whether or not the chlorine that is made to act on the cotton fabric which still contains some sizing ingredients is actually combined with the starch or other constituents is actually combined with starch or other constituents of the size the four following determinations were made.

In the first place, the chlorine content of fabric in the bleached state with size still remaining in it was determined. Then the sample was thoroughly boiled with distilled water and the chlorine content was determined once again. In the third place, the chlorine content of the fabric was established after it had been first thoroughly desized and then boiled several times with distilled water. Finally the fabric was first thoroughly boiled with distilled water and then desized with the acid of a half per cent solution of Diastofor. Then the chlorine content of the Diastofor solution was determined, which content was orginally held by the size, and this was compared with the chlorine content of the original Diastofor solution.

If chlorine is combined with the size, then the chlorine content in the third test must be smaller than that on the second test. For then the fabric which has been freed from soluble chlorine by means of the boilings in distilled water would lose still further amounts of chlorine when subjected to the desizing action of a Diastofor solution. The chlorine that is present in the size can be chemically combined only with the starch ingredients. On the other hand it is also possible that the starch could hold the chlorine in the form of colloidally held chloride. In this case in the fourth test the Diastofor solution, which contains the size, must be considerably richer in chloride content than the original Diamstofor solution.

The test was made by taking four samples, each weighing about 25 grams and being cut from the same piece of cloth. The weighing was conducted in a closed weighing flask and all the weighings were performed within the same hour, in order to eliminate any error that might arise due to the variation in moisture contained in the samples. The strips of cloth were then quickly impregnated with a cold five per cent solution of sodium carbonate. Then they were dried in a quart crucible and ashed. Under these conditions the chlorine must remain combined with the soda, for the ashing was conduced at a moderately high temperature. The residue was carefully taken up with five cubic centimeters of water and ten cubic centimeters of nitric acid, of one to five concentration, and then washed into a hundred cubic centimeter measuring flask through a chlorine-free filter. Ten cubic mentimeters of this solution were then compared with the aforementioned solutions of sodium chloride. The comparison was made in test tubes of equal size and with equal quantities of nitric acid and silver nitrate used in effecting the precipation of the chlorine. The turbidity of the samples was examined against a dark background and both the standard tube and the tube under examination were kept under uniform lighting conditions. It was found that in the first experiment one gram of cloth contained 1.09 milligrams of chlorine, in the second 0.68 milligrams of chlorine, in the third 0.49 milligrams of chlorine. The result of the fourth test indicated that the chlorine content before and after treatment with the Diastofor solution was the same as far as the solution itself was concerned.

The net conclusion that is derived from this series of experiments is that chlorine is chemically combined to a certain degree with the starch of the size. This is an important matter, for when a fabric is sized which contains a certain residue of size which has not been removed in the preliminary Diastofor treatment the subsequent action of chlorine on the fabric will result in its combination with the starch ingredient. It is then impossible to wash it out by boiling with dater. It follows that such cloth will be subject to the action of the chlorine, which in time will probably be liberated, resulting in the deterioration of the cotton fibers. It was not determined whether or not the character of the starch makes any difference as far as the action of the chlorine is concerned, or whether the chemical condition of the bleach liquor, whether it is alkaline, acid or neutral, has any effect on the process. These are points which should be investigated further.

Statesville Mills Entertain Overseers.

A most enjoyable oyster supper was recently tendered the superintendents, overseers, seconds, section men, oilers and others by the Statesville Cotton Mills, Statesville, N. C. W. C. Sykes, superintendent of the mill acted as toastmaster.

After supper, there were a number of talks, the speakers including E. M. Smith, Charles Lambeth and F. B. Bunch, the latter treasurer of the mill.

Lancashire Cotton Industry Hampered by Lack of Good Demand.

The uncertainty regarding the American cotton crop and price levels has prevented the materialization of a good demand for Lancashire cloths. Prospective cotton-goods buyers still lack confidence in the stability of prices, according to cable from Acting Commercial Attache H. D. Butler, London. Offers received by the Lancashire mills have been too low for acceptance. Except for an active demand for light-weight goods, trade with India continues on a moderate scale. Substantial buying is not expected from China until the reopening of the Shanghai auctions next February. In an attempt to balance production and sales, the Federation of Master

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Origin and Removal of Stains

(Continued from Page 14)

dered at the places where the iron, due to the increased rate of the evolution of oxygen, is converted from cellulose into oxycellulose. This can be demonstrated by dyeing with Methylene Blue.

The only way to avoid such damage is to was hout the stains previous to bleaching. This may be done as before (oil, soap, etc., don't let them set or dry). The best way, however, is to avoid the possibility of the stains occurring. This can be done by carefully watching the oiling of the bearings and shafting. In the dyehouse itself these stains are likely to occur on the bleached and dyed pieces from a similar cause. The only prevention is perfect cleanliness. A piece of waste soaked in grease placed in the bearing makes a safe lubricant. For machines in the dyehouse the safest lubricating oil is castor oil and where the possibility exists of the oiled part touching the fabric or affecting the liquor, Turkey red oil can be used.

Iron Stains.

In the case of cloth spotted over with iron stains this may occur through many causes. They are generally due to the presence of iron in some form in the sizing ingredients. The most likely ingredients are chlorides of zinc, magnesium or calcium, or the water used for making the mixing. Certain water containing these salts, or tanks, cause iron pipes to rust and if this rust is carried to the size the iron stains are sure to form. The two impurities which cause these stains (or likely to) are hypochlorite of calcium, which acts upon iron and causes it to rust, and chloride of iron, which will produce iron stains of itself. Iron stains which are due to the causes mentioned above, generally develop during the weaving or after the cloth has been stored for some time.

Iron stains are sometimes formed in the weaving room by water dropping upon the cloth from a rusty iron beam. The water carries the iron rust down with it, and if it be not noticed by the weaver, it will pass through several folds of cloth as it winds on the roller. Water produced by condensation will also produce iron stains if it drops upon the cloth which is in contact with the iron of the loom. The loom quickly rusts and this is transferred to the cloth.

Iron stains are very often caused by the cloth coming in contact with oil that has been used for lubricating the bearings of the loom. This kind of stain is known as "black oil stain," and will have the appearance of ordinary iron stains when the oil is removed.

Tests for Iron.

The following are good tests for iron stains:

1. Burn a portion of the cloth containing the stain, and compare ash produced with that obtained by burning an unstained portion of the same goods. Dissolve each ash in diluted hydrochloric acid in separate test tubes and dilute each with distilled water so as to make a 50 c.c. of solution. To each of the solutions add two drops of ferrocynide of potassium solution. The ash containing iron will give a deep blue color, while the other should have a faint blue color only.

2. Immerse a portion of the stained cloth and a portion of the unstained cloth in a mixture of diluted hydrochloric acid and a diluted solution of ferrocynide of potassium. The portion showing the stain will develop an intense blue color if it be due to iron.

3. Immerse a portion of the stained cloth; and a portion of the unstained cloth in a diluted solution of nitric acid and sulphocyanide of potassium. The stained portion will develop a blood red discoloration if iron be present.

If iron stains are caused through coming in contact with black oil they should immediately be washed out as above to remove the oil, this will leave the yellow iron oxide, this is afterwards treated with salts of lemon. Oxalic acid is frequently used for this purpose, but is more injurious to the cloth than salts of lemon. If the iron-stain be a very fast one, it may be removed by first treating it with diluted hydrochloric acid and afterwards rubbing it with a crystal of sulphate of copper. These chemicals must be entirely removed by washing the cloth in clean water afterwards.

Where black oil has come in contact with cloth great care should be taken in removing it, especially if the cloth has to be bleached, dyed, and finished. If the mineral oil is not entirely removed the bleached cloth will contain yellow stains and if it be for dyeing the stained portion will not take the dye properly; it is also very essential that every trace of oxalic acid or salts of lemon should be washed out of the cloth, especially if the goods are for bleaching. Whenever the bleaching liquor comes in contact with a portion of the cloth that has been treated with the above materials and where it has not been thoroughly washed, the cloth will be more or less tendered through the formation of oxycellulose.

All forms of iron stains which have been discussed are due to manufacturers faults, or, at any rate, to the faults of those to whom the manufacturer is responsible. But sometimes cloth becomes iron-stained through careless or inferior packing. In order to determine the responsibility in such a case, a bale of cloth, together with the packing should be examined very carefully. The writer knows many instances where the manufacturer has been held to blame, and has had to submit to claims, where the stain has been due to the paper used in packing.

Brown paper always contains oxide of iron, and if this paper be placed in direct contact with heavily sized goods a portion of the oxide of iron is sure to be absorbed. This stain may be carried through many folds of the goods, hence brown paper should never be placed in direct contact with the cloth, but should always have a layer or layers of white paper betwen it and the goods.

Wax stains are usually dark, colored by reflected light, but appear much lighter when examined by transmitted light. They are not very common. These stains do not usually originate in the dyehouse, but have their primary formation in the weaving department. If the goods are for weaving, the wax is separated on boiling and causes no trouble.

It is, **however, in pieces** that have to be dyed in the gray that possible damage exists. When the gray pieces containing the wax threads are put through the preliminary process of the boiling machine, the wax boils out and collects on the surface of the liquor, and there is always a possibility that this scum can be carried along with the pieces out of the machine—adhering to the fabric in patches. In the subsequent dyeing operation this shows up as dark uneven patches.

Closely related to these, tar and wax stains are the machine stains given previously. The removal of these presents considerable difficulty but careful dolleying with soap and organic solvents accompanied with perhaps some detergent such as Fuller's earth, etc., are necessary.

Lime stains may be caused by bad boiling or plaiting, deficient circulation, too strong liquor, incomplete souring, or excess of oxygen. Stains may occur in the soda boil for the same reason. Washing and souring well in most cases brings the goods right unless the fabric is too far gone. Lime burn is produced by mechanical enlargement of unslacked lime or magnesia and shows itself in small holes. Discoloration and stains caused by incomplete bottoming in boiling is very common and is caused by bad circulation and may be cured in a great measure by reboiling and souring the stained parts.

We have seen many of the residual coloring matters left in the fibre after this process, gradually work their way to the surface, thus producing loss of color. Closely related to these discolorations are those produced by rosin and soap, which often produce chloramines with the chemics used, and these discolorations are very difficult, if not impossible, to remove. The process necessary, especially if chloramines are absent, depends upon the liberation of the fatty or rosin acids, and then the subsequent removal of sodium salts by reboiling and washing.

Regarding oxycellulose of all kinds, stains are produced in this, both in the boiling, and bleaching process. There is no remedy for this damage. Stains due to bacterial growth. These may occur at any stage of the process. They are due to various causes but largely (1) damp; mildew never comes in dry places or on goods which are kept in perfectly dry places; (2) want of air; on goods which are constantly exposed to air, mildew is but rarley, if ever, seen; (3) The presence of suitable bodies on which the fungi feeds, such as flours of various cereals, nitrogenous bodies, starchy and fatty bodies. These last, however, are not so sustaining to fungi as flour and nitrogenous bodies, and hence are displacing them with advantage in sizing or finishing of cotton goods.

The growth of mildew fungi may be prevented easily by the addition to the size or mixing of many bodies which kill the fungoid spores present in the size mixing or which may find their **way on to** the finished [illegible]. **These bodies are** known as antiseptics and all bodies or cloths finished or otherwise, containing carbolic acid or oxychloride of zinc or in the case of finished whites for vulcanizing should be finished in ammonia water or they will turn brown, or, if it is for finished white for shoes and canvas goods, they should be finished with alkaline (ammonia is best) and oxychloride of zinc.

It is not fair to charge the finisher with all cases of mildew that may appear after he has done with the goods. Even if the finisher does his work well, mildew will often happen if the goods are kept in a damp place. Mildew cannot be got out of cloth when it once gets in, but when only present in small amount it does not exert any tendering action on the cloth. When it is developed strongly enough mycelia of the fungi growth enters the fibre and undoubtedly weakens the cloth very much.

A stain that is often seen is due to the aniline used in the cement in the factories and is caused by the formation of pseudo-maceroine in the goods. The preventive is soda, ammonia, no blue or iron in size or starch; and finish in some strong antiseptic.

Stains are caused by the goods rubbing in rope, transit around some corner, or some sharp turn, or pegrail.

Pressure Gage Snubber

To any one who has to do with water or steam pressure devices, the matter of fluctuating pressure-gage indications is too well known to need comment. The vibrating and jumping of the gage hand not only renders the reading of the exact pressure almost impossible, but also results in the rapid wear of the working parts of tht gage, so that in a comparatively short time the gage will register inaccurately and require renewal.

W. H. Kelley, of Charlotte, N. C., having had considerable experience with this class of work, set about to remedy this trouble, and has developed what he calls a "snubber," which has exactly the same action on the gage indicator that the ordinary automobile snubber has on the occupant of the car. Mr. Kelley tried this device out in connection with triplex pumps supplying water to humidifying systems, and the results were so encouraging that he has developed the attachment to meet the demands of almost any service.

It is an exceedingly simple contrivance, and screws on to the pressure line just ahead of the gage,—or at any other convenient location in the pipe line leading to the gage. It does not affect the accuracy of the indication, but it does eliminate all the vibration, and the water or steam gage is given practically an indefinite life.

It is of such a novel nature that Mr. Kelley has secured a patent, which was issued to him on December 8, 1925.

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Sheetings, Combed Peeler Yarns

Cotton Goods

New York.—Cotton goods were generally quiet throughout the week. Buyers, while admitting that prices were attractive, were not willing to purchase in a large way. The nearness of the holidays and stock taking time was a factor in the quiet trading. The majority of mills have sufficient business on hand to keep them busy on sheetings, print cloths, cloths for the mechanic trades and many lines of fine convertibles. Mills making narrow sheetings, drills and some of the other coarse yarn cloths are not so well supplied with orders.

Print cloths markets were very quiet as the week closed. Prices are somewhat easy but there is quite as little pressure to sell as to buy. Sales of 38½-inch 64x60s were made at 8½ cents for late delivery in a small way, and fair sized future sales of 60x48s were made at 7¾ cents. There was some trading in 80 squares at 12 cents and some business in 72x76s at 11½ cents. Narrow goods are available on a basis of 6 cents for 27-inch 64x60s.

Sheetings rule quiet and mills are becoming in need of more business on some constructions of the narrow widths. Sales of 5.50s were made at 7⅛ cents and 7¼ cents. Some sales of 30-inch osnaburgs were reported at new low prices on part waste goods. Drills were quiet. There was little doing in general lines of convertibles.

On broadcloths and warp sateens, most quotations on 100x60 carded seemed to be 13¼ cents and on 100x64, 13¾ cents, contract; mills were asking 12½ cents on 90x60, 4.32 yard, and some had sold in second hands earlier in the week at 12¼ cents. The nominal range on 128x68-all-combed was 18½ to 19 cents, with some choice makes still being quoted higher.

Limited trading featured fine goods during the week. A number of fancies were in preparation and a few were said to have been placed in the way of linings, dress goods and other specialties. Handkerchief fancies have continued active sellers, as indicated by orders placed so far this week. These were of rayon and cotton mixtures with colored cotton yarns.

Moderate trading was reported in the Fall River print cloth market, with sales reported of 27-inch, 44 square, 9.50, at 5⅛.

In the wide styles, additional business was put through in 38½-inch, 52x40, 7.30, 6⅝, and 38½-inch, 60x48, 6.25, at 7¾.

Activity was noticed in 27-inch, 56x52, 9.00, at 5¼. In narrows, 31½-inch, 48 square, 8.70, reported sold at 5 9-16, and 56x52, 7.50, at 6½.

Revision in prices on finished goods made fair progress during the week. The important lines of 4/4 bleaches have been changed in price. One house returns to its June list, on wide sheets, sheetings and pillow cases. Tickings were priced on a basis of 22½ for 8 ounce at the close of the week. There have been several quotations in denims on the basis of 18 cents for 2.20s and there have been reports that certain goods could be bought for less. This process of readjusting finished goods must be completed before general trade resumes. Flannels for the cutting-up trade are being opened at 8 to 10 per cent under last year.

Important gray goods merchants are watching the finished goods situation keenly because of the situation developing, where converters are inclined to wait for business in their trade before making sizeable commitments on gray goods.

Cotton goods prices in this market were quoted as follows:

Print cloths, 28-in., 64x64s	6½
Print cloths, 28-in., 64x60s	6¼
Print cloths, 27-in., 64x60s	6
Gray g'ds, 38½-in., 64x64s	9¼
Grays goods, 39-in., 68x72s	10
Gray goods, 39-in., 80x80s..	12
Brown sheetings, 3-yard...	12¾
Brown sheetings, 4-yard...	10½
Brown sheetings, stand....	13¾
Ticking, 8-oz.	22½
Denims	19
Staple ginghams, 27-in.....	11½
Kid finished cambrics	9½a10½
Dress ginghams	13½a17½
Standard prints	9½

Toronto Textile Trade Fair.

Toronto, Can.—Inquiry among the textile and fabric houses in Toronto reveals the fact that most of the firms are enjoying good business. Interviews do not suggest anything abnormal, but a brisk and increasing demand for fall and winter goods is declared to be general, while some fluctuations depend on the weather.

The Penman Co.'s branch in Toronto reported that the mild weather had held up the demand for heavy underwear, but that business generally was excellent. They say: "For several months trade has been very goods and we fell the pulse as soon as any. That mild spell had its effect on business immediately. Just now there is severe competition from England. Since 1814 there has been a great change in their methods, and they now cater to Canadian business as they did not formerly. But a great many lines have come to Canada and are permanently fixed here.

Southeastern Selling Agency
LESSER-GOLDMAN COTTON COMPANY
OF ST. LOUIS, MO.
P. H. PARTRIDGE, Agent, Charlotte, N. C.
Extra staples, and good 1 1-16 and 1⅛ cotton from Arkansas, Oklahoma, and Texas, and Memphis territory.

The Yarn Market

Philadelphia, Pa.—There was no marked change in the yarn market during the week. Lower cotton prices made for weaker yarn prices, here, but reports from the South were that spinners were holding asking prices firm in most cases. Dealers have offered small quantities of carded yarns at concessions when they could find stocks available. Price revisions downward were scattered and a good deal of price irregularity has developed.

Toward the latter part of the week there was a good deal more buying interest and several sales ranging as high as 50,000 pounds were reported. According to sellers, the prices on these yarns were well in line with spinners prices. A few sales for future delivery into April were made. Many mills are behind in their deliveries, having sold well into March and some of them much further.

Combed yarns continued strong although recent sales have not been large. Spinners of these yarns are sold further ahead than mills generally on carded yarns.

The coming of the holiday season and the inventory period is causing a general dullness in the yarn trade that is not expected to be over before the middle of January Between now and then, business is expected to be on a very limited basis.

Quotations in this market, given below, are in most instances, well under spinners prices.

Southern spinners are again calling attention to the fact that they are encountering much difficulty in securing spot cotton supplies of suitable grade and staple without paying a premium of general market quotatons. They state that spot cotton quotations are not a fair basis for yarn comparisons under present conditions.

Southern Two-Ply Chain Warps.

8s	35	a--
10s	36	a--
12s	37	a--
16s	37½	a--
20s	39	a--
24s	42	a--
26s	43½	a--
30s	44½	a45
40s	56	a57
50s	66	a67

Southern Two-Ply Skeins.

8s	34	a--
10s	35	a--
12s	36	a--
14s	37	a--
16s	37½	a--
20s	38	a38½
24s	41	a--
26s	42½	a43
30s	44	a--
36s	52	a--
40s	54	a55
40s ex.	57	a58
50s	65	a66
60s	72	a--
Tinged Carpet ---- 3 and 4-ply	32	a33
White Carpet ---- 3 and 4-ply	34	a--

Part Insulated Waste Yarns.

6s, 1-ply	29½	a--
8s, 2, 3 and 4-ply	30½	a31
10s, 1-ply and 3-ply	33	a--
12s, 2-ply	34	a--
16s, 2-ply	36	a--
20s, 2-ply	37	a--
26s, 2-ply	42½	a--
30s, 2-ply	43	a44

Duck Yarns—3, 4 and 5-ply.

8s	34	a--
10s	35	a--
12s	36	a36½
16s	37	a37½
20s	38	a38½

Southern Single Chain Warps

10s	35	a--
12s	36	a--
14s	37	a--
16s	38	a--
20s	39	a--
24s	41	a--
26s	42	a--
30s	44	a45
40s	55	a--

Southern Single Skeins.

6s	34	a--
8s	34½	a--
10s	35	a--
12s	36	a--
14s	36½	a--
16s	37½	a--
20s	38	a--
22s	40	a41
24s	41	a--
26s	42	a43
30s	44	a45

Southern Frame Cones

8s	24	a--
10s	34½	a--
12s	35	a--
14s	35½	a--
16s	36	a--
18s	37	a--
20s	38	a--
22s	38½	a--
24s	40	a40½
26s	41	a42
28s	42½	a43
30s*	41½	a42
30s	45	a46
40s	51	a52

*Tying in.

Southern Combed Peeler Skeins, Etc.—Two-Ply.

16s	56	a60
20s	58	a62
30s	65	a67
36s	75	a80
50s	87½	a90
60s	90	a95
70s	1 05	a1 10
80s	1 18	a1 20

Southern Combed Peeler Cones.

10s	48	a49
12s	49	a50
14s	49½	a50½
16s	52½	a--
18s	51	a52
20s	52	a--
22s	53	a--
24s	56	a--
26s	56½	a--
28s	57	a--
30s	60	a--
32s	62	a--
34s	65	a--
36s	72	a--
38s	74	a--
40s	75	a--
50s	80	a--
60s	90	a95
70s	1 05	a--
80s	1 15	a--

Eastern Carded Peeler Thread—Twist Skeins—Two-Ply.

20s	50	a--
22s	51	a--
24s	56	a--
30s	59	a--
36s	63	a--
40s	65	a--
45s	70	a--
50s	75	a--

Eastern Carded Cones.

10s	39	a--
12s	40	a--
14s	41	a--
20s	42	a--
22s	45	a--
26s	49	a--
28s	51	a--
30s	53	a--

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WANT position as overseer fancy cloth room or finishing department. Have had 18 years experience in finishing room, including experience on chambrays and ginghams. Good references. No. 4735.

WANT position as overseer of carding or spinning. Reliable man of long experience who can furnish satisfactory references. No. 4736.

WANT position as overseer weaving on sheetings, print cloth, drills, duck, or osnaburgs. Eight years as night overseer and sceond hand in large mill. I. C. S. graduate in warp preparation and plain weaving. Age 39. Married, sober, now employed. Good references. No. 4737.

WANT position as master machanic. Experienced on both steam and electric drive and am hard worker who can run your job right. References. No. 4738.

WANT position as master mechanic or machinist Steam or electric drive, can handle turbines, engines, generators and am first class all around man. No. 4739.

WANT position as superintendent of yarn or cord fabric mill. Age 33, married, have been with large mill for past 8 years, 3 years as assistant superintendent. Good reasons for wanting to change and can give good references. No. 4740.

WANT position as superintendent or overseer carding in large mill. Long practical experience and can give first class references. No. 4741.

WANT position as overseer spinning in good mill. Can come on short notice. Experienced. reliable man of good habits and character and can give suitable references. No. 4742.

WANT position as overseer carding or spinning, or assistant superintendent of yarn mill. Long experience and can furnish references to show character and ability. No. 4743.

WANT position as overseer carding and spinning or second hand. Have had several years experience. Am I. C. S. graduate. Age 30, references. No. 4744.

WANT position as overseer of carding spinning with good Southern mill. Experience and training qualify me as first class man in every respect. No. 4745.

WANT position as superintendent, carder or spinner. Prefer North or South Carolina. Now employed. First class references. No. 4746.

WANT position as overseer weaving. Experienced on wide variety of goods and can run the job in thoroughly competent and satisfacotry manner. No. 4748.

WANT position as overseer spinning, twisting and winding. Excellent references to show long record of satistory serivce. No. 4749.

WANT position as superintendent of small mill or carder and spinner in larger one. Experienced reliable man who can give first class references to show character and ability. No. 4750.

WANT position in slashing, drawing-in spooling or warping department. Am young man, I. S. C. graduate and can keep production up and seconds down. Good references. No. 4751.

WANT position as master mechanic; 13 years experience in mill steam plant and machine shops. Can furnish good references from previous employers. No. 4752.

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WANT position by practical weaver of long experience. Have been overseer for past two years, also second hand for four years. Understand plain, dobby and box weaving. Best of references. No. 4754.

WANT position as overseer spinning or would take good second hand's place. Long experience and good references to show character and ability. No. 4755.

WANT position as overseer weaving, 21 years experience in mill, 11 years in weaving. Age 36, married, now employed. Can furnish good references. No. 4756.

WANT position as overseer plain weaing, or would consider place as second hand in large mill. Have had about 20 year's experience, mostly on plain weaving. Good references. No. 4757.

WANT position as carder, spinner or both. Now employed as spinner. Have had 25 years experience in carding and spinning, 10 years as overseer. Good habits and can give good references. No. 5758.

WANT position as carder or spinner in large mill or superintendent of smaller mill. Would like opportunity to submit references showing my record. No. 4759.

WANT position as overseer carding. Can run any card room and run it right. Best of references from past employers. Can come on short notice. No. 4760.

WANT position as carder or spinner or either, pay to be at least $36 weekly. Can come on short notice and give references to show ability and character. No. 4761.

WANT position as superintendent of yarn mill or mill on plain weaving. Now employed as overseer carding but am capable of running mill. Good references. No. 4762.

WANT position as master mechanic, maintenance engineer, superintendent of power or general mechanical superintendent. Thoroughly qualified by training, experience and ability to take complete charge of your power problems. No. 4763.

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WANT position as superintendent of yarn. Qualified by experience and training to handle either in satisfactory manner. No. 4767.

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  - Whitin Machine Works.
  - Woonsocket Machine & Press Co., Inc.
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  - Saco-Lowell Shops.
  - Southern Spindle & Flyer Co.
  - Whitin Machine Works.
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  - Wood's T. B. Sons Co.
  - See Clutches.
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  - Chicago Fuse Mfg. Co.
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  - Ferguson Gear Co.
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This Economy yarn baling press is unquestionably the last word in baling press development.

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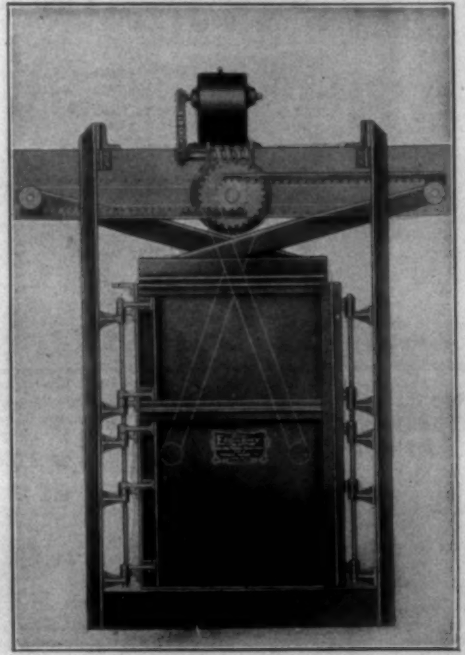

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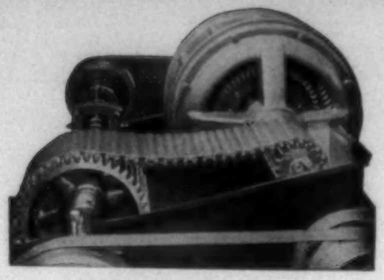

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Textile Chain Drives

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There is a Morse Engineer near you

ATLANTA, GA., 702 Candler Bldg., Earl F. Scott & Co.; BALTIMORE, MD., 1402 Lexington Bldg.; BIRMINGHAM, ALA., Moore-Handley Hdwe. Co.; BOSTON, MASS., 141 Milk St.; CHARLOTTE, N. C., 404 Commercial Bank Bldg.; CHICAGO, ILL., 112 W. Adams St.; CLEVELAND, OHIO, 421 Engineers Bldg.; DENVER, COLO., 211 Ideal Bldg.; DETROIT, MICH., 7601 Central Ave.; LOUISVILLE, KY., 516 W. Main St., E. D. Morton Co.; MINNEAPOLIS, MINN., 413 Third St., Strong-Scott Mfg. Co.; NEW ORLEANS, LA., 521 Baronne St., A. M. Lockett Co.; NEW YORK, N. Y., 50 Church St.; OMAHA, NEB., 727 W. O. W. Bldg., D. H. Braymer Equipment Co.; PHILADELPHIA, PA., 803 Peoples Bank Bldg.; PITTSBURGH, PA., Westinghouse Bldg.; SAN FRANCISCO, CALIF., Monadnock Bldg.; ST. LOUIS, MO., 2137 Railway Exchange Bldg.; TORONTO, 2, ONT., Canada, 50 Front St., E., Strong-Scott Mfg. Co.; WINNIPEG, MANITOBA, Canada, Dufferin St., Strong-Scott Mfg. Co.

MORSE SILENT CHAIN **DRIVES**

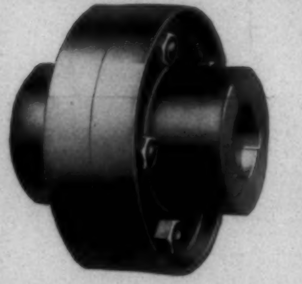
THE MORSE "ROCKER JOINT"

PULLEYS HANGERS

The T. B. WOOD SONS CO. Line

CLUTCHES COUPLINGS

FLANGE OR PLATE COUPLINGS



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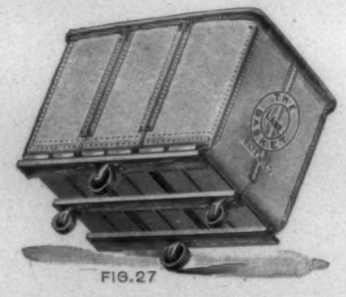

FIG. 27

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